GE Energy Systems

68K System Monitor

User's Guide

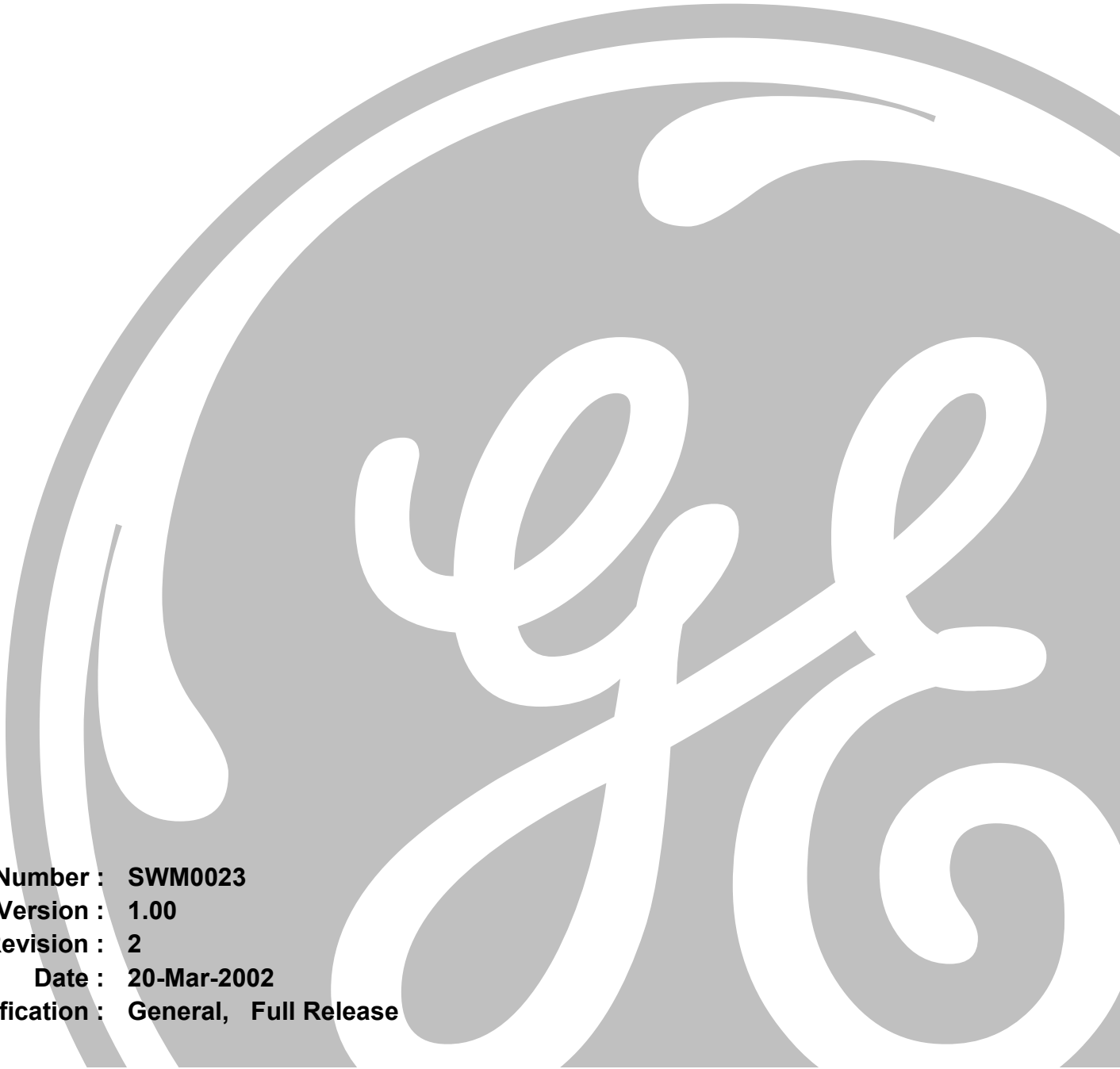

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Table of Contents

About This Document
- Purpose and Audience of this User's Guide viii
- Support Services and Training ix

Chapter 1: Connecting and Using the 68K Monitor
- Connecting to the 68K Monitor 1-2
- Command Input and Response 1-3
- 68K Monitor Display 1-6
- Error Messages 1-7

Chapter 2: Command Grouping
- General System Commands 2-2
- Diagnostic Commands 2-3
- Memory Commands 2-4
- Process Commands 2-5
- Exchange Commands 2-6
- Breakpoint Commands 2-7
- Configuration Maintenance Commands 2-8

Chapter 3: 68K Monitor Commands

Section 1: Command / Platform Cross-Reference 3-2
- Platform-Specific Commands 3-2

Section 2: Monitor Commands 3-4
- AL - Change Auto-logout Timer 3-4
- BAUD - Set Baud Rate 3-5
- BOOT - Startup 3-7
- CACHE - Control Cache 3-8
- CAL - Calibrate KI 3-9
- CB - Clear Breakpoint 3-10
- CCA - Change Configuration File Attributes 3-11
- CCB - Create Configuration Storage Block 3-12
- CCF - Clear Configuration File 3-14
- CF - Copy File 3-15
- CLS - Clear Screen 3-16
- CP - Change Priority 3-17
- CS - Check Sum 3-18
- D - Dump Memory 3-19
- DB - Define Breakpoint 3-21
- DEBUG - Debug Mode 3-22
- DF - Display File Data 3-23
- DHW - Display Hardware Data 3-24
- DIR - Directory 3-25
- DL - Download 3-27
- DM - Debug Mode 3-28

DSTAT - Decompression Status 3-29
E - Edit Memory 3-30
ECHO - Echo Toggle 3-32
EL - Error Log 3-33
ERASE - Flash Erase 3-34
ETH - Ethernet Address 3-35
EXIT - Exit 3-36
F - Fill Memory 3-37
FT - Find Table 3-38
HE or HELP - Help 3-39
HT - HDLC Test 3-40
IMG - Display Image Information 3-41
JTF - Jump To Flash 3-42
JX - Jam Exchange 3-43
KIM - KI Metrics 3-44
M - Move Memory 3-45
PB - Print Breakpoint 3-46
PR - Profile 3-47
PRG - Program Flash 3-49
QC - Query Configuration Storage Parameters 3-50
QP - Query Process 3-51
QR - Query RAM 3-53
QX - Query Exchange 3-54
RB - Resume Breakpoint 3-56
RP - Resume Process 3-57
RR - Report RAM Partitions 3-58
RT - RAM Test 3-59
RTB - Return To BootROM 3-61
RTC - Test CCU RTC 3-62
RX - Request Exchange 3-63
RZ - ZMODEM Download 3-64
SA - Serial Analyzer 3-66
SB - Step Breakpoint 3-68
SC - Select Active Configuration 3-69
SET - Set System Parameters 3-70
SI - Display System Information 3-71
SP - Suspend Process 3-72
ST - Serial Test 3-74
SX - Send Exchange 3-76
SYSC - System 3-77
TEST - Invoke Test Tool 3-78
TR - Trace 3-79
UL - Upload 3-81
VER - Version 3-82
VP - Signal Process 3-83
WINM - WIN Metrics 3-84

Index

About This Document

Overview

Introduction

The **68K Monitor** is a feature of all GE Energy Services products that use a variant of the Motorola 68000 series of microprocessor.

Since the introduction of the first D20 products, the commands that are available in the **68K Monitor** have changed, been added to, and enhanced to address the requirements of the newer products and their software components.

This guide summarizes all of the commands that you will find in any of GE Energy Services' products to-date. You will see in the next chapters that not all commands are available in all products. Some commands exist only for product and software development, and are not found in end-user products.

In This Section

This section of the document contains the following topics

Topic	See Page
Purpose and Audience of this User's Guide	viii
Support Services and Training	ix

Purpose and Audience of this User's Guide

Job Titles

While only experienced programmers should use many of the commands found in this guide, maintenance technicians and other support personnel will also find this guide useful.

Experience & Abilities

GE Energy Services' customers and employees who wish to view detailed information about the software and hardware should use this guide.

Prerequisites

This document assumes that you are familiar with software and programming terminology and practices, and have some knowledge of both the hardware and software.

What This Document Provides

This guide covers the commands found in the **68K Monitors** that run on these platforms:

- CPM running CPM Base
- D20 running D20 Base software
- D20 with D20 ME running D20 Base software
- D20 and D200 using CCU Base software
- D20 and D200 with D20 ME processors running CCU Base
- D25

Notes will show where a command or feature is unique to a specific platform.

This guide is a user reference for the **68K Monitor**. It describes in detail the contents and usage for each available user command. These commands are useful for testing and debugging hardware and software as they provide a means for controlling the system environment at a very low level.

WARNING

The functions provided by **68K Monitors** enable you to alter and manipulate the system at a very low level. At this low level, it is easy to seriously disrupt an operational system.

You *must be aware* of this possibility at all times.

What This Document Does <u>Not</u> Provide.

There are *no* procedures in this document as users should already be familiar with accessing and using GE Energy Services' WESMAINT and monitor maintenance facilities.

Document Style and Convention Rules

This manual uses the *Systeme International* (SI) and the *Microsoft Manual of Style* as a basis for styles and conventions.

Support Services and Training

General	GE Energy Services provides professional assistance in the use of all of its software and hardware products.
Need Help?	If you feel that the information provided in this document is unclear or in error, please contact GE Energy Services for assistance.
Website	http://www.gepower.com/geharrisenergy/ Unlimited access is available to a wide variety of information and company services including: • product information • training and, • technical services.
Technical Support	Representatives are available Monday through Friday, 8:00 a.m. to 5:00 p.m. Mountain Time.
Contacting Us	GE Energy Services 2728 Hopewell Place NE Calgary, Alberta Canada T1Y 7J7 Toll-Free: + 1.800.518.2303 Phone: + 1.403.214.4600 Fax: + 1.403.243.1815 email: GEH_Calgary.Support@ps.ge.com

Chapter 1: Connecting and Using the 68K Monitor

Overview

Connect Defined

An application interface provides an input to and output from the **68K Monitor**. This allows the **68K Monitor** to 'connect' to any application or subsystem, and to any type of hardware (capable of stream or block transfers).

As examples:

- WESMAINT or the Login Process can connect the **68K Monitor** to a serial port.
- WESMAINT and the TELNET application can connect it to the TELNET session.

The **68K Monitor** can also be 'connected' to a file system to receive (read) commands from a file and send (write) responses to another file.

In This Chapter

This Chapter of the document contains the following topics

Topic	See Page
Connecting to the 68K Monitor	1-2
Command Input and Response	1-3
68K Monitor Display	1-6
Error Messages	1-7

Connecting to the 68K Monitor

One 68K Monitor At-A-Time

While any application running in the system can activate the **68K Monitor**, only one instance of the monitor can be active at any one time.

If a second application attempts to start the **68K Monitor**, it will refuse the second application's request.

68K Monitor Prompts

The prompt produced by the **68K Monitor** depends on the hardware platform and the mode the device is in.

As examples:

Examples

The table below shows examples of the prompts that you may see on various devices in different modes of operation.

When this device…	is operating out of…	you will see this prompt…
D25	BootROM (this is known as the *System Monitor*)	D25S>
	FLASH (this is known as the *Application Monitor*)	D25A>
D20 ME (CCU Base)	Service Mode	D20MES>
	Active Mode	D20MEA>
CPM or D20M(++)	Any Mode	D20M>

Terminating a 68K Monitor TELNET Session

The **68K Monitor** will detect a loss of connection in a TELNET session and will end the monitor session, allowing a new connection to be established.

The **68K Monitor** itself *never* terminates or initiates a TELNET session. Whatever process starts the **68K Monitor** handles this functionality.

Auto-Logout Timer

Since only one **68K Monitor** session is allowed at a time, it automatically terminates a session if no input is received for 5 minutes (default) or after a user-programmed interval.

Refer to: Page 3-4, *AL - Change Auto-logout Timer* for details about how this timer can be changed.

Command Input and Response

Input to the 68K Monitor

Input to the **68K Monitor** is read from the 'connected' application / subsystem. The input takes the form of user-entered commands.

Command Line Limitations

The **68K Monitor** accepts a command line:

- that is no longer than 80 characters, and
- consists of no more than 16 separate words or symbols.
  - The definition of a word or string is one or more characters separated by one or more spaces.
  - Input may be either upper or lower case, except where noted.

Command Format

Input may be either upper- or lower-case.

The format of all commands is as follows:

<*command_name*> < *parameters arguments*>

Where:

- *command_name* is one of the recognized commands, and
- *parameter arguments* are an optional list of command parameters.

Common Command Syntax

You must format these commands in a definite way or syntax. You must understand command syntax to understand detailed command descriptions in the following chapters.

List of Characters

This tables lists some of the characters used in command syntax:

Character	Name	Description
/	switch	identifies that the character following it affects the type of processing performed by the command
[ ]	square brackets	any arguments listed within them are optional parameters that the command may use but does not require
|	OR symbol	only *one* of several consecutive arguments listed within parenthesis "( )" is to be used
( )	multiple arguments	when not separated by the OR "|" character means that if one of the arguments is used, they must all be used

Continued on next page

Command Input and Response, Continued

Possible Responses

By entering a command at the prompt and pressing ENTER, one of the following responses will happen.

If you enter	and	then
a recognized command	it does not require special parameters	the system will execute the command.
a recognized command	required parameters are provided	the system will execute the command.
a recognized command	parameters are missing or invalid	a reminder line showing the correct command syntax will appear, including required and optional parameters.
an unrecognizable command	--	a general error will be issued indicating that the command was not recognized.

An Example, the EDIT Command:

If you type:

e *[/(b | w | l | f | d)] address*

According to the syntax conventions:

- The first field, *e*, must be entered as is, because it has no special characters around it.
  - If you press ENTER after typing just the *e*, the line above appears to show you the command parameter syntax.
- The second field, *[/(b | w | l | f | d)],* because it is enclosed in [ ], is optional.
  - Select *one* of the valid switches within the parenthesis ( ) or leave it blank.
- The last field*, address*, is required.

Entering Commands

The **68K Monitor** allows editing of the command line by using regular keyboard input as well as a few special key combinations.

Regular Keyboard Input

In addition to entering any printable ASCII character onto the command line, the following characters can be used:

This key…	performs this function
ESC	deletes all current data on the command line and returns to the first character position. (except D20 base and CPM)
ENTER	executes any command that has been entered on the command line.
BACKSPACE	removes the last character from the end of the current command line and moves the cursor one character position to the left.

Continued on next page

Command Input and Response, Continued

Regular Keyboard Input (continued)

Special Control Characters

You can use these special control characters to perform advanced editing and screen navigation functions.

Command	Characters	Description
Abort	CTRL-C	returns the Monitor to the command line prompt and aborts most commands being processed. Note: a CTRL-C command does *not* work in a TELNET connection.
Delete	CTRL-D	deletes the current character of the previous command line.
Insert	CTRL-I or TAB	toggles the current mode to/from overwrite or insert. The monitor always starts in overwrite mode.
Advance	CTRL-A	causes the monitor to copy the character from the previous command buffer reference location to the current location in the input command buffer. This character also returns the monitor to overwrite mode.
Repeat	CTRL-R	allows editing and re-execution of the previous command by copying the previous command line from the character at the previous command reference location (up to the end of the previous command buffer) into the current input command buffer Note: D20ME and D25 have a 5-line command buffer.
Execute	CTRL-X	copies the most previously used command to the command line and executes it.
Xoff, Xon	CTRL-S and CTRL-Q	the combination of CTRL-S (Xoff) and CTRL-Q (Xon) stops and starts scrolling of the monitor's display.

68K Monitor Display

Output from the 68K Monitor

The **68K Monitor's** output is a stream of ASCII characters written back to the 'connected' application / subsystem. The command executed determines the exact contents of the output.

When encountering a system exception error, or a defined breakpoint, exception and breakpoint handling routines will generate additional output.

Display Output

While most output to the monitor port is a direct result of command input, some occurs asynchronously of the command input.

This requires the use of two methods of output display.

- The first method uses the **monitor-input process**, which formats the output into a common buffer and signals the output process that data is available.
  - All output that occurs synchronously with the input uses this method, including command data and input line display.
- The second method uses **exception-handling routines** to display data that may or may not occur as the result of a monitor command, but cannot be expected to occur synchronously with the input.
  - A pSOS exchange sends this data (including unassigned exception and breakpoint data displays) to the output process.

An Example:

Once a breakpoint is set, the monitor cannot control when or if the system encounters the breakpoint.

The exception and breakpoint display output may occur at any time, and this output has priority over monitor input process output. This may cause occasional interruption of a command or input in progress, or the lack of a prompt re-appearing after displaying the data, but does not affect these functions in any way

Error Messages

Introduction

68K Monitor returns several general error messages resulting from input or syntax errors in the command input, or system or test failures during execution.

These error messages are identified below:

Message Summary

The most general error is an incorrect number of arguments for the command defined. This error causes a display of the correct use of the specified function.

Other possible error messages are listed below:

This Message	is displayed when…
Application which activated the monitor has been deleted! (or suspended)	a process or user requests an exit command, but the process that called **68K Monitor** is suspended or deleted.
Breakpoint defined!	the specified address is already defined as a breakpoint, the monitor will display this message when defining a new breakpoint (DB).
Breakpoint not suspended!	a breakpoint was not encountered when attempting a resume (RB) or step (SB) breakpoint command.
Cannot post to exchange!	a send (SX) or jam (JX) exchange command encounters an error in sending the message to the specified exchange.
Command aborted!	the user replied *NO* when asked to verify a Return to BootROM (RTB) command.
Command not found!	the specified command is not located within **68K Monitor's** command list.
FLASH invalid!	a directory (DIR) command on a FLASH default database fails (i.e., no default database could be detected).
Invalid ID!	the monitor cannot find the specified identification, or it is incorrect. The ID can be a breakpoint number, communications port, table name, or process or exchange ID
Invalid switch!	the user does not specify the mode for the chosen function.
No free breakpoints!	the define breakpoint (DB) command is attempted when all available breakpoints are in use.
Numeric input error!	a numeric field contains non-numeric characters.

Continued on next page

Error Messages, Continued

Message Summary (continued)

This Message	is displayed when…
NVRAM invalid!	the query RAM (QR) command specified NVRAM is but it is corrupt.
Protected process!	attempting to suspend (SP) a critical system process.
Record error!	an invalid record is detected during the download function (DL).
Suspend all processes first!	attempting a download without suspending all processes first.
Test failed!	a system error is detected.

If You Find Yourself in Serious Trouble...

Using the **68K Monitor** it is possible to modify or change something in a device's system that can seriously disrupt the operation of the device

Use this procedure to restore the RTU to its former state, before you used the **68K Monitor** facility to make changes.

Step	Action
1.	Suspend all processes in the RTU.
2.	Fill the NVRAM memory with zeros.
3.	Re-download your configurations and/or Flash code.
4.	Reboot the RTU.

Chapter 2: Command Grouping

Overview

Seven Groups

The **68K Monitor** commands are grouped into seven groups.

The following pages list the commands in each of the groups, and provide a functional cross-reference to help you locate them in this guide.

In This Chapter

This Chapter of the document contains the following topics

Topic	See Page
General System Commands	2-2
Diagnostic Commands	2-3
Memory Commands	2-4
Process Commands	2-5
Exchange Commands	2-6
Breakpoint Commands	2-7
Configuration Maintenance Commands	2-8

General System Commands

Description

This group of commands is essentially a list of unrelated commands that do not logically fit into the other command groups.

List of Commands

This list shows the General System commands, in alphabetical order:

Command	Description	See Page
AL	Change Auto-logout Timer	3-4
BAUD	Set Baud Rate	3-5
BOOT	Boot	3-7
CF	Copy File	3-15
CLS	Clear Screen	3-16
DF	Display File Data	3-23
DHW	Display Hardware Data	3-24
DIR	Directory	3-25
DL	Download	3-27
ECHO	Echo Toggle	3-32
EXIT	Exit	3-36
FT	Find Table	3-38
HE or HELP	Help	3-39
IMG	Display Image Information	3-41
JTF	Jump to Flash	3-42
RR	Report PAM Partitions	3-58
RTB	Return to BootROM	3-61
RZ	ZModem Download	3-64
SI	System Information	3-71
UL	Upload	3-81
VER	Version	3-82

Diagnostic Commands

Description

You can use these diagnostic commands for debugging, performance analysis and hardware system testing.

List of Commands

This list shows the Diagnostic commands, in alphabetical order:

Command	Description	See Page
CACHE	Control Cache	3-8
CAL	Calibrate Kernel Interface	3-9
CS	Check Sum	3-18
DEBUG	Debug	3-22
DM	Debug Mode	3-28
EL	Error Log	3-33
ETH	Ethernet Address	3-35
HT	HDLC Test	3-40
KIM	Kernel Interface Metrics	3-44
PR	Profile	3-47
QR	Query RAM	3-53
RT	RAM Test	3-59
RTC	Test CCU Real Time Clock	3-62
SA	Serial Analyzer	3-66
ST	Serial Test	3-74
SYSC	System	3-77
TEST	Invoke Test Tool	3-78
TR	Trace	3-79
WINM	WIN Metrics	3-84

Memory Commands

Description

Use these memory commands to identify or change the contents of memory in the system.

List of Commands

This list shows the Memory commands, in alphabetical order:

Command	Description	See Page
D	Dump Memory	3-19
E	Edit Memory	3-28
ERASE	Flash Erase	3-34
F	Fill Memory	3-37
M	Move Memory	3-44
PRG	Program Flash	3-49

WARNING

Because executing these commands modifies the memory of your system, they can disrupt operation.

Use caution before proceeding.

Process Commands

Description

Use these commands to examine and alter the state of pSOS processes.

Note: Some of these functions must *only* used for testing and debugging during software development.

List of Commands

This list shows the Process commands, in alphabetical order:

Command	Description	See Page
CP	Change Priority	3-16
QP	Query Process	3-51
RP	Resume Process	3-57
SP	Suspend Process	3-72
VP	Signal Process	3-83

Exchange Commands

Description

Use these commands to examine and alter pSOS exchange data in the system.

Note: Use these functions primarily for testing and debugging purposes during software development.

List of Commands

This list shows the Exchange commands, in alphabetical order:

Command	Description	See Page
JX	Jam Exchange	3-43
QX	Query Exchange	3-54
RX	Request Exchange	3-62
SX	Send Exchange	3-76

Breakpoint Commands

Description

Use these commands with the **68K Monitor** for control and display of process breakpoints in the system.

The three restrictions with the definition of breakpoints are:

- You must define breakpoints in code that is in RAM.
  - The program instruction changes to a 68000 family TRAP instruction.
- You must define all program breakpoints at the beginning of an instruction.
- Only define breakpoints in a process.
  - If the interrupt mask is non-zero when you enter the breakpoint handler, the assumption is that the calling routine is an interrupt service procedure (ISP) and breakpoints are not valid.

Note: Diagnostic Commands are suspended in order to use breakpoints.

List of Commands

This list shows the Breakpoint commands, in alphabetical order:

Command	Description	See Page
CB	Clear Breakpoint	3-9
DB	Define Breakpoint	3-21
PB	Print Breakpoint	3-46
RB	Resume Breakpoint	3-54
SB	Step Breakpoint	3-68

Configuration Maintenance Commands

Description

Use these commands to store and maintain configuration files.

List of Commands

This list shows the Configuration Maintenance commands, in alphabetical order:

Command	Description	See Page
CCA	Change Configuration File Attributes	3-11
CCB	Create Configuration Control Block	3-12
CCF	Clear Configuration File	3-14
QC	Query Configuration Storage Parameters	3-50
SC	Select Active Configuration	3-69

Chapter 3: 68K Monitor Commands

Overview

Introduction

This Chapter is divided into two sections, the first providing a cross-reference table where you can see which platform support what commands.

The second section details each command, listed in alphabetical order.

In This Chapter

This Chapter of the document contains the following Sections and topics

Topic	See Page
Section 1: Command / Platform Cross-Reference	3-2
Platform-Specific Commands	3-2
Section 2: Monitor Commands	3-4

Section 1: Command / Platform Cross-Reference

Platform-Specific Commands

List of Commands

This table lists all of the possible **68K Monitor** commands in the left column, in alphabetical order. The columns to the right show the platforms where the commands will be available for you to use.

Command	CPM/D20	D20ME	CCU	CCUME	D25
AL			*	*	*
BAUD		*		*	*
BOOT	*	*	*	*	*
CACHE				*	
CAL					
CB	*			*	*
CCA			*	*	*
CCB			*	*	*
CCF			*	*	*
CF			*		*
CLS					*
CP				*	*
CS	*	*	*	*	*
D	*	*	*	*	*
DB	*			*	*
DEBUG					*
DF			*		*
DHW					*
DIR			*	*	*
DL	*	*	*	*	*
DM	*	*			
DSTAT			*		*
E	*	*	*	*	*
ECHO				*	*
EL	*	*	*	*	*
ERASE		*		*	*
ETH					
EXIT	*	*	*	*	*
F	*	*	*	*	*
FT	*	*	*	*	*
HE or HELP	*	*	*	*	*
HT	*	*		*	
IMG		*		*	*

Continued on next page

Platform-Specific Commands, Continued

List of Commands (continued)

Command	CPM/D20	D20ME	CCU	CCUME	D25
JTF					*
JX	*	*	*	*	*
KIM					
M	*	*	*	*	*
PB	*			*	*
PR	*	*	*	*	*
PRG				*	
QC			*	*	*
QP	*	*	*	*	*
QR	*	*	*	*	*
QX	*	*	*	*	*
RB	*			*	*
RP	*	*	*	*	*
RR			*	*	*
RT	*	*	*	*	*
RTB					*
RTC					
RX	*	*	*	*	*
RZ					
SA	*	*		*	*
SB	*			*	*
SC			*	*	*
SET				*	*
SI			*	*	*
SP	*	*	*	*	*
ST	*	*	*	*	*
SX	*	*	*	*	*
SYSC					
TEST				*	*
TR					
UL	*	*		*	*
VER	*	*	*	*	*
VP	*	*	*	*	*
WINM					

Note ☞ Some of the commands, such as *CAL* and *KIM*, are not checked-off for any platform. This indicates that these commands are only available when specially built engineering or debugging software is running in the device.

If a product delivered to an end-user displays these commands, a mistake may have occurred. Contact GE Energy Services if in doubt.

Section 2: Monitor Commands

AL - Change Auto-logout Timer

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to change the monitor's auto-logout timer duration from the default of 5 minutes.

Syntax

Below is usage and syntax information for this command

Command Format	al timout (minutes)
Variables	None
Parameters	minutes = 0 to 32767 minutes. '0' disables the timer.
Example	Type *al 15* and press ENTER. Results: The monitor will log out after 15 minutes of inactivity.
Special Considerations	If the timer is disabled, (set to '0') the monitor can be locked-out for any other user.

BAUD - Set Baud Rate

Platform

☐ CPM ☐ D20 D20 Base ☑ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to change the data rate of the WESMAINT port to a user-configured value.

Syntax

Below is usage and syntax information for this command

Command Format	baud baud_rate
Variables	None
Parameters	baud_rate = the new data rate for the port, in bps.
Example	Type *baud 4800* and press ENTER. Results: The monitor switches to communicate at 4800 bps.
Special Considerations	See warning below.

About Changing the Baud Rate

The **68K Monitor** has the ability to change the communication speed of the D25 and D20 ME WESMAINT ports. This is useful when downloading large files.

Example: A 1 M code file may take upwards of 40 minutes to download at 9600 bps (the default). At 38400 bps, only 10 – 15 minutes.

Note: Most PCs cannot exceed 115,200 bps, and some terminal programs (Windows Terminal for example) may have other restrictions. Check the respective program's User's Guide for help.

WARNING 1

The system will not save speed changes made using this command in NVRAM. The monitor will return to 9600 bps after a restart.

If you execute this command in a D25 monitor, it will modify the data rate of both the WESMAINT and the D25MAINT ports, since they run off the same data rate generator.

GE Energy Services recommends that you use this command *only* to speed up a serial download, and *not* to redefine the operational state.

WARNING 2

Enter the baud rate correctly, as the function is capable of setting the data rate to *any* value.

Example:

Forgetting to enter the final zero when trying to change the data rate to 19200 bps would result in a rate of 1920 bps, preventing any further communication. A reboot will return the speed to the 9600 bps default.

Continued on next page

BAUD - Set Baud Rate, Continued

Supported Speeds

The supported data rates, in bps, are:

* D25 has a maximum speed of 38400 bps.

900	3600	28200
1050	4800	* 38400
1200	7200	57600
1800	9600	115200
2000	14400	230400
2400	19200	

BOOT - Startup

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to remove all defined Monitor breakpoints and then force the system to go through its lowest level start-up.

This ensures that the system is properly re-initialized after testing, system manipulating, or downloading.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D20ME / CCU/ CCUME boot D25 boot [/i] [delay]
Variables	delay = number of milliseconds to wait before the boot is performed
Parameters	/i = skip all additional system processing and reset the system immediately
Example	Type *boot* and press ENTER. Results: The system responds with the normal boot-up screen. It displays a series of messages relating to hardware and software initialization.
Special Considerations	This command will automatically clear all breakpoints before execution. This command causes all processors in a multi-processor system to reboot.

CACHE - Control Cache

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☐ D25

Description

Use this command to enable and disable the CPU's cache.

Syntax

Below is usage and syntax information for this command

Command Format	cache /(d | e)
Variables	/d = disable processor cache /e = enable processor cache
Parameters	None
Example	Type *cache /d* and press ENTER. The monitor disables the processor cache.
Special Considerations	None

CAL - Calibrate KI

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☐ D25

Description

For D200s only.

Use this command to calibrate the Kernel Interface inter-processor communications.

Syntax

Below is usage and syntax information for this command

Command Format	cal (<values> | /h | /?)
Variables	/h = displays help /? = displays help
Parameters	Values = ?
Example	Not required
Special Considerations	For use by qualified programmer only.

CB - Clear Breakpoint

Platform

☑ CPM	☑ D20 D20 Base	☐ D20 ME D20 Base	☐ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to clear breakpoints that are currently set.

- By specifying a breakpoint number, this command clears that breakpoint.
- By not specifying a breakpoint, it clears all defined breakpoints.

Breakpoints are cleared by:

1. replacing the 68000 family TRAP instruction with the original instruction, and then
2. clearing the entry in the breakpoint table

Syntax

Below is usage and syntax information for this command

Command Format	cb [break_pt#]
Variables	None
Parameters	break_pt# = breakpoint number; default is all breakpoints
Example	Type *cb 3* and press ENTER. This clears breakpoint number 3. Results: The system displays the prompt.
Special Considerations	None

CCA - Change Configuration File Attributes

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to modify the configuration file attributes for a given configuration file.

Overwrites the old attributes with the new attributes.

Syntax

Below is usage and syntax information for this command

Command Format	cca file_num
Variables	None
Parameters	file_num = The query configuration storage parameters command displays all existing files, giving each a numerical index. Use this index with this command to specify the affected file.
Example	Type *cca 1* and press ENTER. see below
Special Considerations	When this command is invoked, the user is provided with the current attributes of the file using the characters: • 'c' (currently selected file) • 'o' (opened), and • 'r' (corrupt). The user is expected to enter the attributes to change by typing the character representing the attribute ('c', 'o', or 'r') followed by '+' to add it or '-' to remove it. The same command can change any of the attributes. You can enter the same attribute multiple times, but only the last entry will take effect. You can separate each attribute by a space, but do no separate the attribute and its add/subtract character, and any other characters on the command line will result in an error.

CCB - Create Configuration Storage Block

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to create the configuration storage block at a specified location or allocate it out of RAM.

The amount of memory space allocated to configuration storage and other relevant parameters are also required.

- The Monitor invalidates any existing storage block before creating the new one.
  - If requested to make the block in NVRAM, the command assumes it to be a part of a static configuration storage region and will simply use the memory as specified (base address and size).
  - By specifying RAM, the monitor expects the block to be temporary, and allocates memory out of normal pSOS RAM.

Syntax

Below is usage and syntax information for this command

WARNING

Any existing stored configurations will be lost when this command is invoked!!!

Command Format	ccb [/(n | v | r)] base_address total_ram response_file_size num_cfgs nvram_base
Variables	/n = Build configuration block in global NVRAM region using the base_address supplied. /v = Allocate the configuration block from normal RAM, ignoring the base address. /r = Reset CCB. Old CCB is cleared before new one created
Parameters	base_address = Address of start of configuration storage region, in hexadecimal (must be present, even if it's just zero for RAM configuration blocks). total_ram = Total amount of NVRAM allocated to the region, in bytes. response_file_size = Size of response file, in bytes. num_cfgs = Total number of configurations to store, maximum of 2. nvram_base = Address of start of NVRAM region.

Continued on next page

CCB - Create Configuration Storage Block, Continued

Parameters (continued)

Example	Type *ccb 600000 100000 400 2* and press ENTER. Results: The monitor creates a configuration storage control block at address 0x600000, taking the next 0x100000 bytes as the space for the configuration storage system. After allocating the size of the storage control structures and the 0x400 bytes for the response file, the command divides the remaining space into two equal slices to store configurations.
Special Considerations	Use this command primarily when the system first initializes, in order to set up the configuration storage space. After that, it expects to be only rarely invoked.

CCF - Clear Configuration File

Platform

☐ CPM	☐ D20 D20 Base	☐ D20 ME D20 Base	☑ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to erase the specified configuration file.

The command clears all contents of the file, and it clears all attribute flags as well.

Syntax

Below is usage and syntax information for this command

Command Format	ccf file_num
Variables	None
Parameters	file_num = The query configuration storage parameters command displays all existing files, giving each a numerical index. This index specifies the file that you wish cleared.
Example	Type *ccf 1* and press ENTER. The monitor erases the contents of stored configuration 1.
Special Considerations	Used only when multiple storage regions are defined

CF - Copy File

Platform

☐ CPM	☐ D20 D20 Base	☐ D20 ME D20 Base	☑ D20/200 CCU Base	☐ D20/200 ME CCU Base	☑ D25

Description

Use this command to copy file information from one file to another.

Primarily, use the command to transfer files containing configuration, application FLASH and DSP FLASH program data into their destination regions.

Also, use it to copy any one file to another, depending on the support for copying provided by the File System Driver that owns the files.

Syntax

Below is usage and syntax information for this command

Command Format	cf source_file [destination_file]
Variables	None
Parameters	source_file = The name of the file containing the source data. This is always required, and is the full path name of the file. If the operation is transferring configuration or FLASH program information (DSP or application), then only the source name is required. destination_file = The name of the file into which the source file data is to be copied. If you intend to copy configuration or FLASH program information (DSP or application) into its destination region, this name is optional and unnecessary
Example	Type *cf flash.zlb* and press ENTER. Results: The monitor copies the file *flash.zlb* into Flash EPROM.
Special Considerations	Once invoking this function, it may take some time for the command to write the file into its destination; especially if it consists of compressed configuration or FLASH program information (DSP or application).

CLS - Clear Screen

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☑ D25

Description

Use this command to clear the monitor's screen.

Syntax

Below is usage and syntax information for this command

Command Format	cls
Variables	None
Parameters	None
Example	None Required.
Special Considerations	None

CP - Change Priority

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to change the current priority of an existing process.

Syntax

Below is usage and syntax information for this command

Command Format	cp (/h | ((pid | PName) (delta | abs)))
Variables	/h = display help
Parameters	pid = PID number PName = name of the process delta = the priority change to be made. A negative value reduces priority. A positive value adds priority. abs = the final priority of process after change in Hex
Example	Type *cp WES0 +20* and press ENTER. Results: The monitor increases the priority of process WES0 by (delta) 0x20. Note: Process/Task names, like WES0, *are* case-sensitive.
Special Considerations	If you use this command to change the priority of the IDLE process, the system will reboot.

CS - Check Sum

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to perform a checksum or 32-bit CRC of either the boot code area, NVRAM area, or application code area.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D25: cs / (b | n | p) CCU / CCUME: cs / (b | n | p | g)
Variables	/b = boot code area /n = NVRAM area /p = application code area /g = global NVRAM area
Parameters	None
Example	Type *cs /g* and press ENTER; this performs a check sum of the global NVRAM area. Results: The system responds with the calculated and expected checksums of the specified area, and the message *Checksum is ___ and should be ___*. A new prompt appears.
Special Considerations	Performing *cs* on flash memory will require 5 to 10 minutes.

D - Dump Memory

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to display memory contents as bytes, words, long words, floating-point numbers, or double-precision numbers.

Each line of output is formatted as:

at the left margin:

- starting address of the memory, hexadecimal.

then:

- 16 bytes (octets) of data grouped as:

- bytes – hexadecimal format
- words – hexadecimal format
- long words – hexadecimal format
- floating-point numbers – scientific format
- double-precision numbers – scientific format

then:

- 16 ASCII characters representing the same memory values.

If an octet does not have a printable ASCII representation, the monitor will print a dot instead.

Syntax

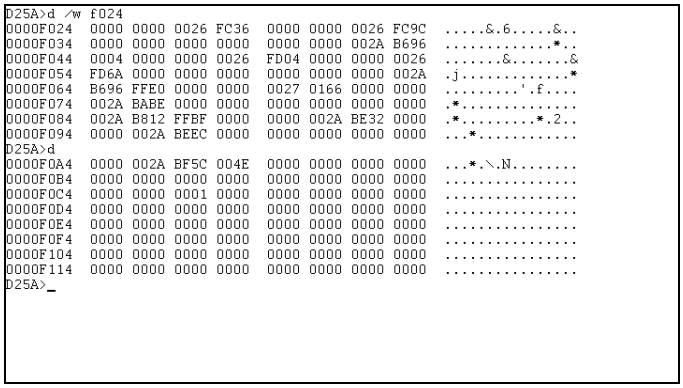
Below is usage and syntax information for this command

Command Format	d [/(b | w | l | f | d)] beg_addr [end_addr]
Variables	/b = bytes (octets), the default mode /w = words /l = long words /f = floating-point numbers /d = double-precision numbers
Parameters	By not entering any parameters, the command requests a dump from the last user-entered memory dump location. The dump is in the previously specified format (if any) and dumps for 80 bytes. beg_addr = first address to display, in hexadecimal. end_addr = address up to which to display, in hexadecimal; the default is beg_addr plus 80 hexadecimal.

Continued on next page

D - Dump Memory, Continued

Syntax (continued)

Example	Type *d /w f024* and press ENTER. Results: The system displays the specified data (eight lines consisting of address, eight hexadecimal words, and 16 ASCII characters, starting at hexadecimal address F024), then displays the prompt.  Type *d* and press ENTER. Results: The system displays the next eight lines starting at hexadecimal address F024+80=F0A4, then displays the prompt.
Special Considerations	• An attempt to display non-existent memory results in a bus error. • If this is the first dump, not specifying any parameters will return an error.

```
D25A>d /w f024
0000F024  0000 0000 0026 FC36  0000 0000 0026 FC9C  .....&.6.....&..
0000F034  0000 0000 0000 0000  0000 0000 002A B696  .............*..
0000F044  0004 0000 0000 0026  FD04 0000 0000 0026  .......&.......&
0000F054  FD6A 0000 0000 0000  0000 0000 0000 002A  .j.............*
0000F064  B696 FFE0 0000 0000  0027 0166 0000 0000  .........'.f....
0000F074  002A BABE 0000 0000  0000 0000 0000 0000  .*..............
0000F084  002A B812 FFBF 0000  0000 002A BE32 0000  .*.........*.2..
0000F094  0000 002A BEEC 0000  0000 0000 0000 0000  ...*............
D25A>d
0000F0A4  0000 002A BF5C 004E  0000 0000 0000 0000  ...*.\.N........
0000F0B4  0000 0000 0000 0000  0000 0000 0000 0000  ................
0000F0C4  0000 0000 0001 0000  0000 0000 0000 0000  ................
0000F0D4  0000 0000 0000 0000  0000 0000 0000 0000  ................
0000F0E4  0000 0000 0000 0000  0000 0000 0000 0000  ................
0000F0F4  0000 0000 0000 0000  0000 0000 0000 0000  ................
0000F104  0000 0000 0000 0000  0000 0000 0000 0000  ................
0000F114  0000 0000 0000 0000  0000 0000 0000 0000  ................
D25A>_
```

DB - Define Breakpoint

Platform

☑ CPM	☑ D20 D20 Base	☐ D20 ME D20 Base	☐ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to activate a breakpoint in a section of code located within RAM.

At the specified address, the command saves 68000 family instruction in the breakpoint table and replaces it with a TRAP instruction. When a process reaches the TRAP instruction, it traps into a breakpoint handling routine, which displays a message indicating that it encountered a breakpoint.

The **68K Monitor** allows up to ten active breakpoints.

Syntax

Below is usage and syntax information for this command

Command Format	db address [#loops]
Variables	None
Parameters	address = hexadecimal address for the breakpoint. #loops = number of times to execute the specified address (in decimal) before stopping; default is zero
Example	Type *db 103648* and press ENTER. This defines a breakpoint at hexadecimal address 103648, which stops before the first execution of the instruction at that address. Results: The system responds with the breakpoint number assigned to this breakpoint and the prompt. Each time it encounters the breakpoint, the system displays the breakpoint number, loop count, and register values. If the loop count is greater than zero, it is decremented. Otherwise, the process is suspended.
Special Considerations	You may define only one breakpoint at a single address, to a maximum of ten breakpoints per system. An attempt to define a breakpoint in read only or non-existent memory results in a bus error.

DEBUG - Debug Mode

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☑ D25

Description

Use this command to put the D25 into Debug Mode.

This mode disables certain checks in the system so that it will ignore small system violations during debugging sessions (such as allowing the writing of FLASH code to RAM during a download).

In this mode, you can make making changes to the base address and size of the SRAM, NVRAM and FLASH regions in the NVRAM configuration header.

Syntax

Below is usage and syntax information for this command

Command Format	DEBUG
Variables	None
Parameters	None
Example	Type *DEBUG* and press ENTER. Results: The output displays the current debug state. The user receives the following prompt: *Do you wish to update the NVRAM header? (y/n)* Any reply other than 'y' aborts the rest of the command. Otherwise, the command prompts you to enter new values for the FLASH, SRAM, and NVRAM base address and size. Entering a zero indicates that the item is to remain unchanged. Once the new data has been entered, you are prompted: *Is this data accurate? (Y/N)* Any response other than 'y' will cause the monitor to re-issue the prompts for the FLASH, SRAM, and NVRAM base address and size. Pressing CNTRL-C will abort the command. If the user responds 'y', the command writes new data to the NVRAM header and a new NVRAM header CRC is calculated and stored.
Special Considerations	The debug command is a toggle, turning the debug mode ON if it is OFF, and OFF if it is ON. Enabling the Debug Mode degrades the performance of the system and may cause certain CPU intensive commands to activate the watchdog and reset the system.

DF - Display File Data

Platform

☐	CPM	☐	D20 D20 Base	☐	D20 ME D20 Base	☑	D20/200 CCU Base	☐	D20/200 ME CCU Base	☑	D25

Description

Use this command to display the contents of any file in memory in text or binary format.

The default is binary format, which mimics the dump command by displaying the binary values first, then the printable ASCII values afterward.

You may view any file recognized by the Installable File System.

Syntax

Below is usage and syntax information for this command

Command Format	df [/(b | t)] filename
Variables	/b = Display contents in binary format (default). /t = Display contents as text.
Parameters	filename = The full path name of the file to be displayed.
Example	Type *df /b config.bin* and press ENTER. Results: The monitor displays the contents of the file *config.bin* in a manner similar to the dump command.
Special Considerations	By not providing any other switch, the command selects the binary dump format, and is identical to the dump memory command format except that it lacks the address prefix.

DHW - Display Hardware Data

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☑ D25

Description

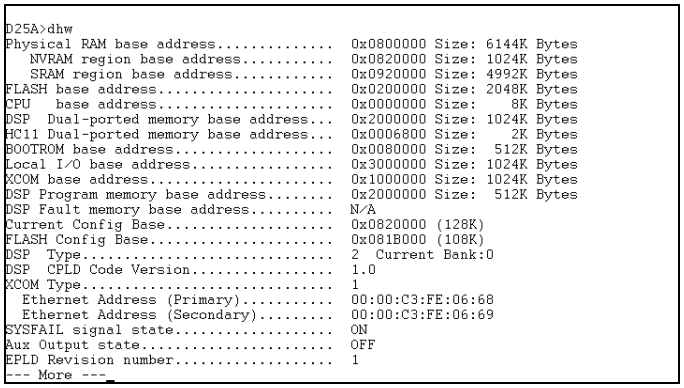
Use this command to display information on the hardware configuration of the D25.

The provided information consists of:

- size and base address of all memory regions
- DSP and XCOM type
- state of the auxiliary output and sysfail signal, and
- EPLD and PCB revision numbers.

Syntax

Below is usage and syntax information for this command

Command Format	dhw
Variables	None
Parameters	None
Example	Type *dhw* and press ENTER  Results: A comprehensive list of hardware and memory information is displayed.
Special Considerations	None

```
D25A>dhw
Physical RAM base address.............  0x0800000 Size: 6144K Bytes
   NVRAM region base address...........  0x0820000 Size: 1024K Bytes
   SRAM region base address............  0x0920000 Size: 4992K Bytes
FLASH base address.....................  0x0200000 Size: 2048K Bytes
CPU   base address.....................  0x0000000 Size:    8K Bytes
DSP  Dual-ported memory base address...  0x2000000 Size: 1024K Bytes
HC11 Dual-ported memory base address...  0x0006800 Size:    2K Bytes
BOOTROM base address...................  0x0080000 Size:  512K Bytes
Local I/O base address.................  0x3000000 Size: 1024K Bytes
XCOM base address......................  0x1000000 Size: 1024K Bytes
DSP Program memory base address........  0x2000000 Size:  512K Bytes
DSP Fault memory base address..........  N/A
Current Config Base....................  0x0820000 (128K)
FLASH Config Base......................  0x081B000 (108K)
DSP  Type..............................  2  Current Bank:0
DSP  CPLD Code Version.................  1.0
XCOM Type..............................  1
  Ethernet Address (Primary)...........  00:00:C3:FE:06:68
  Ethernet Address (Secondary).........  00:00:C3:FE:06:69
SYSFAIL signal state...................  ON
Aux Output state.......................  OFF
EPLD Revision number...................  1
--- More ---
```

DIR - Directory

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to display a directory of the database tables residing in a specified memory type. Database table information consists of:

name - table name

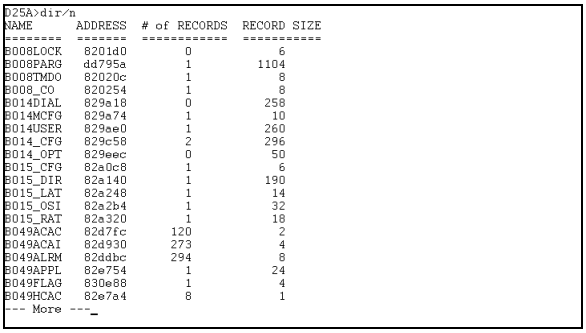
address - the absolute table memory address

records - the number of valid records in the table

record size - the size, in bytes of each record

Syntax

Below is usage and syntax information for this command

Command Format	D25: dir [/(n | p)] CCU / CCUME: dir [/(l | g | e)]
Variables	/l = local NVRAM database tables (default) /g = global NVRAM database tables /e = EPROM/Flash default configuration database tables /n = D25 NVRAM /p = D25 Flash
Parameters	None
Example	Type *dir /n* and press ENTER.  Results: The monitor displays the above information for all NVRAM database tables. At the end of every full screen, the monitor prompts "--More--", and will continue when any key is pressed.

Continued on next page

DIR - Directory, Continued

Syntax (continued)

Special Considerations	Global database tables only exist if a multi-node CCU is present. EPROM database tables form the default configuration for the CCU. They are optional and may not have been included in the CCU. If any type of database is unavailable, the DIR command will return an error message.

DL - Download

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to download data (typically configuration files (all platforms) or D25 and CCUME application (FLASH) code).

Note: When downloading application code files, this command must be used *only* when executing from the BootROM. This will be indicated by the *D25A>*, or the *D20MEA>* prompts for the D25 or D20ME-based systems, respectively.

The Monitor accepts S1, S2 and S3 data records, and S7, S8 and S9 end records, and optional S0 comment records in the downloaded file. The monitor rejects all other types of records.

Once the command verifies the checksum within the record, the contents of data records (S1, S2 or S3) are stored in memory. When it receives an S7, S8 or S9 end record, the DOWNLOAD command returns control to the Monitor's command line.

Syntax

Below is usage and syntax information for this command

Command Format	D25 / CCUME: dl [/o offset] CPM / D20 / CCU: dl
Variables	offset = the offset at which to download
Parameters	/o = specifies that an offset follows
Example	Type *dl* and press ENTER. Results: This prepares the monitor to receive Motorola S-records over the serial port. The monitor does not echo any further until it encounters an end record (the prompt returns at this point) or a format or record checksum error (this returns an error message before returning the prompt).
Special Considerations	Each S-record, terminated by a carriage return or line feed, cannot exceed 80 decimal bytes in length. Application code download works ONLY when: • The BootROM code is being executed AND • The FLASH region has been erased.

WARNING

Executing this command modifies the memory of the system, and can cause operational disruption.

Use caution before proceeding.

DM - Debug Mode

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☐ D25

Description

Use this command to enable or disable product-specific debugging modes.

- For the 68020, (D20M) and 68EC030 (D20 ME) it disables the on-chip instruction cache.
- For the 68332, (CPM) it enables show cycles.

When enabled, both of these debug mode instructions allow external bus monitoring.

Syntax

Below is usage and syntax information for this command

Command Format	dm /(d | e)
Variables	/d = disable debug mode (Enable cache or disable show cycles) /e = enable debug mode (disable cache or enable show cycles)
Parameters	None.
Example	Type dm /e and press enter. Results: This command disables the 68020 or 68EC030 on-chip instruction cache or, enables show cycles for the 68332. The system returns the prompt upon completion of this instruction.
Special Considerations	Enabling the Debug Mode degrades the performance of the system and may cause certain CPU intensive commands to activate the watchdog and reset the system.

DSTAT - Decompression Status

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☑ D20/200 CCU Base ☐ D20/200 ME CCU Base ☑ D25

Description

Use this command to view status of file copy command progress and success.

Syntax

Below is usage and syntax information for this command

Command Format	dstat [l | m]
Variables	l = leave immediately (default) m = maintain connection until process complete, showing progress while connected.
Parameters	None
Example	Not required
Special Considerations	None

E - Edit Memory

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to display and modify memory locations. The command does not verify memory contents after they are stored. After entering the command, it prompts you with the current contents of a memory location.

The different display and edit formats supported are:

- bytes – hexadecimal format
- words – hexadecimal format
- floating-point numbers – hexadecimal format
- scientific format – scientific format
- double-precision numbers – scientific format

When the contents of the memory location appear, type:

- a new value to store at the location
- a hyphen (-) to back up one location
- a plus sign (+) or the ENTER key to move forward one location (CCU / D25 only)
- a period (.) to exit this function

Scientific values must subscribe to the following format:

[±] mantissa [e [±] exponent]

The mantissa can contain a decimal point. This command differentiates between a negative number and a hyphen.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20:	e [/(b | w | l | f | d)] address
	CCU / CCUME / D25:	e [/(b | w | l | f | d)] [/x] address
Variables	/b =	bytes (octets), the default mode
	/w =	words
	/l =	long words
	/f =	floating-point numbers
	/d =	double-precision numbers
	/x =	do not display existing contents of memory location being edited

Continued on next page

E - Edit Memory, Continued

Syntax (continued)

Parameters	address = address to edit in hexadecimal notation
Example	Type *e /l 200000* and press ENTER. This indicates that you are editing RAM memory, starting at address 200000 hexadecimal in long word format. Results: The system continues to display the current address location and data at that location in hexadecimal format, until you use a period (.) to return the monitor prompt.
Special Considerations	• An attempt to display non-existent memory or modify EPROM memory results in a bus error. • You may modify systems with FLASH EPROM such as the D25 and CCUME using this command.

ECHO - Echo Toggle

Platform

☐ CPM	☐ D20 D20 Base	☐ D20 ME D20 Base	☐ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to turn command line echoing on and off.

It only affects the **68K Monitor's** echoing of user-entered keystrokes, and not the results of any commands.

Syntax

Below is usage and syntax information for this command

Command Format	echo [(on | off)]
Variables	None
Parameters	on = turns command line echoing on off = turns command line echoing off.
Example	Type *echo off* and press ENTER. Results: The monitor no longer displays your keystrokes as you type.
Special Considerations	None

EL - Error Log

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

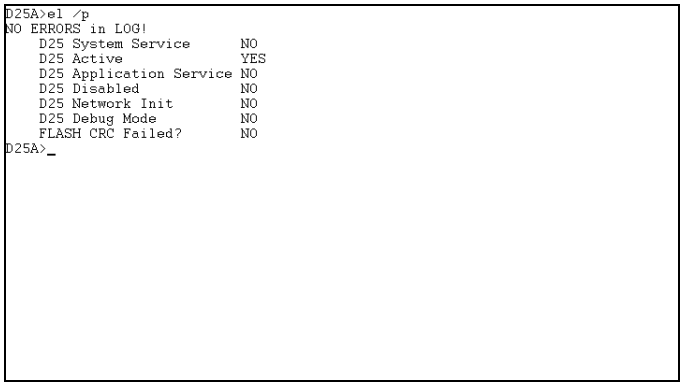
Use this command to display and delete system error log entries stored in NVRAM for a single or multi-processor system.

The display command also presents the current system state, and any significant low-level system errors which occur.

The delete function deletes system error log entries from memory, and clears the disabled state if the system is in a disabled state.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 el / (p | r) D20ME / CCU / D25 el / (p | r | f)
Variables	/p = print the error log entries /r = reset (delete) the error log entries /f = fix an error log that contains an infinite loop
Parameters	None
Example	Type *el /p* and press ENTER.  Results: This command displays the error log entries maintained by the system and the system state. The system returns the prompt when it completes this instruction
Special Considerations	None

```
D25A>el /p
NO ERRORS in LOG!
    D25 System Service      NO
    D25 Active              YES
    D25 Application Service NO
    D25 Disabled            NO
    D25 Network Init        NO
    D25 Debug Mode          NO
    FLASH CRC Failed?       NO
D25A>_
```

ERASE - Flash Erase

Platform

☐ CPM ☐ D20 D20 Base ☑ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Note: this command is available only when executing from the BootROM. This will be indicated by the *D25A>*, or the *D20MEA>* prompts for the D25 or D20ME-based systems, respectively.

Use this command to perform an erase of the Flash memory region, resetting all bytes in Flash to 0xFF in preparation for application data download.

Syntax

Below is usage and syntax information for this command

Command Format	D25: erase [/d /y] D20 ME / CCUME: erase [/y]
Variables	None
Parameters	/d = erase DSP Flash /y = disable the verification prompts
Example	Type *erase* and press ENTER. Results: If you confirm the **erase** prompt, the command erases the Flash EPROM.
Special Considerations	The command prompt will return if Flash is already clear when the erase command is invoked. Otherwise, the command prompts the user to confirm the Flash erase. If you enter any response other than "y", the command aborts the erase.

WARNING

Executing this command modifies RTU memory and will cause operational disruption (specifically by destroying all Flash application code).

Do not use this command unless you are prepared to perform a code download procedure.

Use caution before proceeding.

ETH - Ethernet Address

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☐ D25

Description

Use this command to change the Ethernet address of a D25's hardware interfaces.

Syntax

Below is usage and syntax information for this command

Command Format	eth /(d | u) [b1 b2 b3 b4 b5 b6]
Variables	/d = display address /u = update address
Parameters	[b1 b2 b3 b4 b5 b6] = 6 byte Ethernet address
Example	Nor required
Special Considerations	Do not use unless qualified. Address change is permanent, and will stay in D25 XCOM hardware even if moved to another D25.

EXIT - Exit

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to perform a limited clean up of the **68K Monitor**, and return to the calling routine (such as WESMAINT) if it has not been suspended.

Syntax

Below is usage and syntax information for this command

Command Format	exit
Variables	None
Parameters	None
Example	Type *exit* and press ENTER. Results: The monitor returns control to the calling routine.
Special Considerations	The task that started the ***68K Monitor*** must still exist and be running (i.e. not suspended). This command automatically clears all active breakpoints but does not perform any other clean-up operations. This means that if you enable debug mode, if something has suspended processes, or any other system alterations made, they will remain in effect even after exiting the monitor.

F - Fill Memory

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to repeatedly write a value to a specified region of memory.

The command requires three numerical arguments in hexadecimal format:

- first is the starting address of the region to fill
- second is the ending address of the region
- third is the value to write to the memory region

The fill value may be a byte (octet), a word, or a long word, depending on the mode selected by the switch.

Syntax

Below is usage and syntax information for this command

Command Format	f [/(b | w | l)] beg_addr end_addr value
Variables	/b = bytes (octets), the default mode /w = words /l = long words
Parameters	beg_addr = start address of region in hexadecimal end_addr = address to fill up to in hexadecimal value = value to put in region in hexadecimal
Example	Type *f /w 200000 200400 F034* and press ENTER. Results: This fills the RAM memory from hexadecimal address 200000 to 200400 with words of F034 hexadecimal. The system displays the prompt when it completes this instruction.
Special Considerations	• An attempt to fill EPROM memory results in a bus error. • You can modify systems with FLASH EPROM such as the D25 and CCUME using this command.

FT - Find Table

Platform

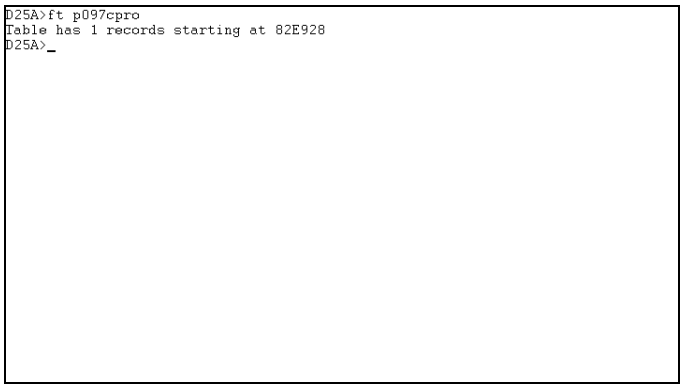
☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to search available Database Manager resources to obtain the address and number of records in a database table within the database management system.

Syntax

Below is usage and syntax information for this command

Command Format	ft table_name
Variables	None
Parameters	table_name = name of the database table to locate (not case-sensitive).
Example	Type *ft p097cpro* and press ENTER. to locate the P097CPRO table in the database.  Results: The monitor displays the hexadecimal format address and decimal format number of records in the specified table. It displays zeros for the address and number of records if it does not find the table.
Special Considerations	This command may not function if NVRAM is corrupted. This is because the NVRAM header inside the D25 contains the location of the root table of the Database Manager and all of the table identification blocks.

HE or HELP - Help

Platform

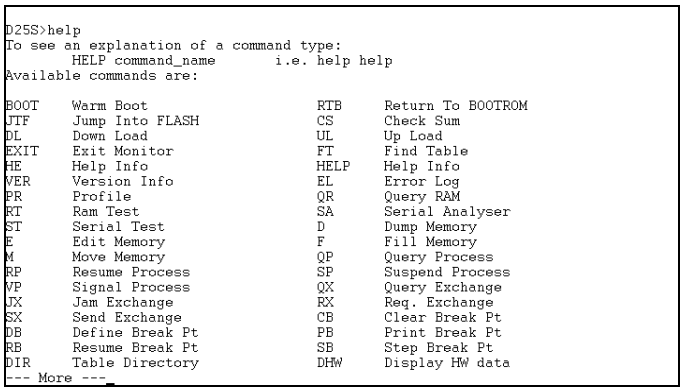
☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to display a list of all available monitor commands on the screen, or a description and usage for a given specific command.

Syntax

Below is usage and syntax information for this command

Command Format	CCU / CCUME / D25 he or help [command] CPM / D20 help [command]
Variables	None
Parameters	command = name of the specific command you wish to obtain information about.
Example	Type *help* and press ENTER.  Results: System displays a list of available monitor commands and returns either to the prompt, or will prompt you (with `---More---`) to press any character to display the rest of the list.
Special Considerations	None

```
D25S>help
To see an explanation of a command type:
        HELP command_name       i.e. help help
Available commands are:

BOOT    Warm Boot                       RTB     Return To BOOTROM
JTF     Jump Into FLASH                 CS      Check Sum
DL      Down Load                       UL      Up Load
EXIT    Exit Monitor                    FT      Find Table
HE      Help Info                       HELP    Help Info
VER     Version Info                    EL      Error Log
PR      Profile                         QR      Query RAM
RT      Ram Test                        SA      Serial Analyser
ST      Serial Test                     D       Dump Memory
E       Edit Memory                     F       Fill Memory
M       Move Memory                     QP      Query Process
RP      Resume Process                  SP      Suspend Process
VP      Signal Process                  QX      Query Exchange
JX      Jam Exchange                    RX      Req. Exchange
SX      Send Exchange                   CB      Clear Break Pt
DB      Define Break Pt                 PB      Print Break Pt
RB      Resume Break Pt                 SB      Step Break Pt
DIR     Table Directory                 DHW     Display HW data
--- More ---
```

HT - HDLC Test

Platform

☐ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☐ D25

Description

Use this command to transmit specific application messages over the HDLC communication link.

Note: Because you must assemble these messages by hand, you can not use the command effectively unless you know the protocol used by the D.20 application.

Syntax

Below is usage and syntax information for this command

Command Format	ht /(c | m | r | s | w)
Variables	/c = configure the link parameters /m = define the application message /r = read (monitor) the link /s = display configuration status /w = send an application message
Parameters	None
Example	None required
Special Considerations	This command is not available on the CPM. This command is not available if the D.20 (B003) application is active.

IMG - Display Image Information

Platform

☐ CPM	☐ D20 D20 Base	☑ D20 ME D20 Base	☐ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to display information on the BootROM, FLASH, and NVRAM configuration images.

The information consists of:

For the BootROM and FLASH images, a description string and a part number;

For the NVRAM configuration, the static CRC and configuration version.

Note: If any of this information is not available, the monitor will display a message indicating this in place of the expected information.

Because the IMG command only displays information entered into the MODULE.MAK file used in the SDS system, any omissions or mistakes in the MAK file will be reflected in the output of this command.

Syntax

Below is usage and syntax information for this command

Command Format	img
Variables	None
Parameters	None
Example	Type *img* and press ENTER. Results: The monitor displays information on the FLASH, BootROM, and configuration images currently active in the system.
Special Considerations	None

JTF - Jump To Flash

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☑ D25

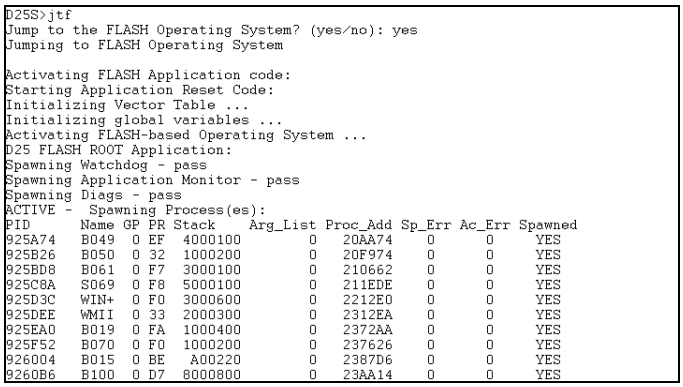
Description

Use this command to place the D25 in Active Mode.

The system stops execution out of the BootROM region, and it activates the FLASH operating system.

Syntax

Below is usage and syntax information for this command

Command Format	jtf
Variables	None
Parameters	None
Example	Type *jtf* and press ENTER. Type *yes* to confirm.  Results: The system returns to FLASH operation mode.
Special Considerations	The system must be operating out of BootROM to use this command. The system halts and deletes all applications currently executing on the RTU when activating the FLASH operating system.

```
D25S>jtf
Jump to the FLASH Operating System? (yes/no): yes
Jumping to FLASH Operating System

Activating FLASH Application code:
Starting Application Reset Code:
Initializing Vector Table ...
Initializing global variables ...
Activating FLASH-based Operating System ...
D25 FLASH ROOT Application:
Spawning Watchdog - pass
Spawning Application Monitor - pass
Spawning Diags - pass
ACTIVE -  Spawning Process(es):
PID      Name GP PR Stack    Arg_List Proc_Add Sp_Err Ac_Err Spawned
925A74   B049  0 EF  4000100        0   20AA74    0       0     YES
925B26   B050  0 32  1000200        0   20F974    0       0     YES
925BD8   B061  0 F7  3000100        0   210662    0       0     YES
925C8A   S069  0 F8  5000100        0   211EDE    0       0     YES
925D3C   WIN+  0 F0  3000600        0   2212E0    0       0     YES
925DEE   WMI   0 33  2000300        0   2312EA    0       0     YES
925EA0   B019  0 FA  1000400        0   2372AA    0       0     YES
925F52   B070  0 F0  1000200        0   237626    0       0     YES
926004   B015  0 BE   A00220        0   2387D6    0       0     YES
9260B6   B100  0 D7  8000800        0   23AA14    0       0     YES
```

WARNING

This command causes the D25 to shift into *active mode* immediately, without performing any checks on FLASH.

Be sure that your FLASH region contains valid application data before invoking this command.

JX - Jam Exchange

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to force a message to the beginning of the message queue at one or more exchanges.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D25: jx (xid | name) m2 m3 m4 m5 CCU / CCUME: jx (xid | gxid | name) m2 m3 m4 m5 [/g]
Variables	/g = Allows the message to be jammed into a queue in a different node
Parameters	xid = pSOS exchange ID (in hexadecimal); send message to a specific exchange. gxid = global exchange ID (in hexadecimal); send message to a specific exchange. name = case-sensitive exchange name. The command supports the new exchange naming convention. If you enter an entire name, the monitor sends the message to that exchange. If you enter the first few characters, the command attempts pattern matching. It sends the message to one or more exchanges depending on the number of matches. m2 - m5 = first through fourth long words in the body of the message, in hexadecimal.
Example	Type *jx 304540 1 2 3 4* and press ENTER. This sends a message to an exchange identified as 304540. The command sets the first two reserved messages to 0. Results: Unless it encounters an error, the system displays the prompt. In the case of an error, it displays an error message before the prompt.
Special Considerations	You must only use this command in a testing or debugging context. If you send an indiscriminate message to an exchange, you cannot predict the results.

KIM - KI Metrics

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☐ D25

Description

D200 only.

Use this command to view the Kernel Interface Metrics.

Syntax

Below is usage and syntax information for this command

Command Format	kim [/r] (node_number | 0)
Variables	/r = reset
Parameters	node_number = processor number of D200 0 = all processors
Example	Type *kim 3* and press ENTER Results: Displays the metrics of node 3 (3rd processor)
Special Considerations	Used during debug process only. Requires special code to use

M - Move Memory

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to copy memory from one memory region to a writeable memory region.

It requires three hexadecimal quantities, which define the:

- source address
- destination address, and
- number of bytes to transfer

Syntax

Below is usage and syntax information for this command

Command Format	m from_addr to_addr num_bytes
Variables	None
Parameters	from_addr = start address of the source region in hexadecimal to_addr = start address of the destination in hexadecimal num_bytes = size in bytes (octets), hexadecimal, of the region to move
Example	Type *m 200000 200400 200* and press ENTER. Results: This copies the RAM memory region 200000 up to 200200 to the region 200400 up to 200600. The system displays the prompt when it completes this instruction.
Special Considerations	An attempt to move to EPROM or non-existent memory will result in a bus error. You can modify systems with FLASH EPROM such as the D25 and CCUME using this command.

PB - Print Breakpoint

Platform

☑ CPM	☑ D20 D20 Base	☐ D20 ME D20 Base	☐ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to display breakpoint information about any or all-active breakpoints in the system.

While the system suspends a process at a breakpoint, this instruction causes the display of the suspended process ID and the register values when it encounters the breakpoint. These values differ from those printed with the query process command, as the latter prints the values at the time of the last process swap.

Syntax

Below is usage and syntax information for this command

Command Format	pb [break_pt#]
Variables	None
Parameters	break_pt# = breakpoint number as returned with the defined breakpoint command.
Example	Type *pb* and press ENTER. Results: If the system encounters a breakpoint, it responds with a list of all active breakpoints in the system and, the process ID, loop count, and register values, in hexadecimal. It then displays the prompt without affecting the state of any breakpoint.
Special Considerations	None

PR - Profile

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to display run-time statistics of all processes in the system, including:

- the number of times the process was swapped in
- the number of system real-time clock ticks occurring during its run periods
- the average number of ticks (in tenths of a tick) per run (average)
- the CPU usage (in 10^{ths} of percent) of the process
- the maximum period between watchdog process operations.

Note: Each clock tick is one millisecond.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20M pr / (p | r) CCU / CCUME / D25 pr / (p | r | t)
Variables	/p = print the process profile /r = reset process profile counts /t = print the process profile in the sequence of CPU usage percentage
Parameters	None
Example	Type *pr /r* and press ENTER. Results: The command resets the counts associated with process profiling and watchdog run period. The system displays any specified data and then returns the prompt

Continued on next page

PR - Profile, Continued

Syntax (continued)

Special Considerations	Important points to note: • Data format of the output run count and run ticks are decimal integral values. – Ticks per run are tenths of milliseconds and CPU use are tenths of a percent decimal. – The system represents figures in decimal notation. • This profiler does not account for interrupt service CPU usage. • Roll-over of the profiler's counts occurs after some time more than 14 days. – The exact roll-over time depends on the running applications, and may vary greatly between sites and remotes.

PRG - Program Flash

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☐ D25

Description

Use this command to program a FLASH memory.

Syntax

Below is usage and syntax information for this command

Command Format	prg [/(b | w | l)] address data		
Variables	/b	=	bytes (octets), the default mode
	/w	=	words
	/l	=	long words
Parameters	address	=	address at which to store the data, in hexadecimal
	data	=	the data to store
Example	Not Required		
Special Considerations	Use with great care. Command will change contents of Flash memory without updating checksum.		

QC - Query Configuration Storage Parameters

Platform

☐ CPM	☐ D20 D20 Base	☐ D20 ME D20 Base	☑ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to display the contents of the configuration storage block, providing information such as:

- how many configurations are stored in the system
- how much memory is allocated to configuration storage, and
- the creation time and date of the stored configurations.

Note ☞

The number used to identify each file in this display is the file index.

The system uses this number to identify the file affected by the clear configuration file, change configuration file attributes, and select active configuration commands.

Syntax

Below is usage and syntax information for this command

Command Format	qc
Variables	None
Parameters	None
Example	Type *qc* and press ENTER. Results: The monitor displays the information about existing configuration storage.
Special Considerations	None

QP - Query Process

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

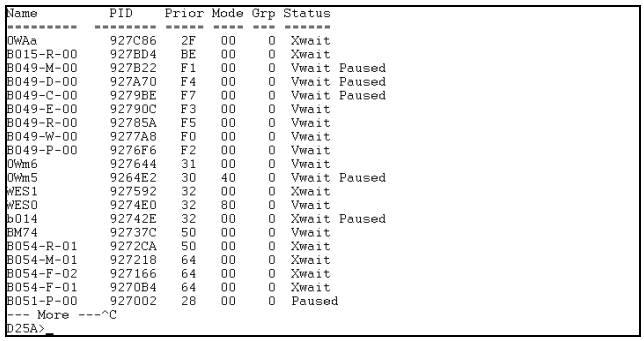
Description

Use this command to display the:

- general status of all currently active processes
- general status of specific processes, or
- detailed information about one currently active process.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D25: qp [(pid | name)] CCU / CCUME: qp [(pid | gpid | name)]
Variables	None
Parameters	(none) = display general status information for all processes. pid = pSOS process ID (in hexadecimal); display detailed information for a specific process. gpid = global pSOS process ID (in hexadecimal); display detailed information for a specific process. name = case-sensitive process name. Supports the new process naming convention. To display an entire name, enter detailed information for that process. If you enter the first few characters, the command attempts pattern matching. The monitor displays general or detailed information depending on the number of matches.
Example	Type *qp* and press ENTER.  Results: The system displays process information about all active processes, and then returns to the prompt.

```
Name         PID    Prior Mode Grp Status
---------  -------- ----- ---- --- ------
OWAa         927C86   2F   00    0  Xwait
B015-R-00    927BD4   BE   00    0  Xwait
B049-M-00    927B22   F1   00    0  Vwait Paused
B049-D-00    927A70   F4   00    0  Vwait Paused
B049-C-00    9279BE   F7   00    0  Vwait Paused
B049-E-00    92790C   F3   00    0  Vwait
B049-R-00    92785A   F5   00    0  Vwait
B049-W-00    9277A8   F0   00    0  Vwait
B049-P-00    9276F6   F2   00    0  Vwait
OWm6         927644   31   00    0  Vwait
OWm5         9264E2   30   40    0  Vwait Paused
WES1         927592   32   00    0  Xwait
WES0         9274E0   32   80    0  Vwait
b014         92742E   32   00    0  Xwait Paused
BM74         92737C   50   00    0  Vwait
B054-R-01    9272CA   50   00    0  Xwait
B054-M-01    927218   64   00    0  Xwait
B054-F-02    927166   64   00    0  Xwait
B054-F-01    9270B4   64   00    0  Xwait
B051-P-00    927002   28   00    0  Paused
--- More ---^C
D25A>_
```

Continued on next page

QP - Query Process, Continued

Syntax (continued)

Special Considerations	All numeric data displayed is in hexadecimal notation.

Information Details

The response to all QP commands will include:

- process name
- process ID
- group ID
- priority
- current run state

The response to QP commands that specify processes will include:

- received signals
- time slice
- run ticks
- run count
- owned memory segments
- register values at the time of the last swap

Current Run State

This table lists the states that the processes may be in at any time:

In this state…	the process…
Await	is spawned but not activated.
Vwait	is waiting for a pSOS signal.
Xwait	is waiting for a message from another process to arrive at an exchange.
Paused	has sent a 'pause' request to processor.
Suspended	has been spawned and activated, but is not running. • This state may be a normal condition, or may indicate a fatal configuration or system error. Check the WESMAINT *Logger* to verify.

Multi-Processor Displays

For a multi-processor system, this command displays:

- a specific global process' summary consisting of its node and local pid, or
- the process summary of all local processes to the node, and all global processes in the system.

QR - Query RAM

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to examine the RAM allocation and use for either static RAM or NVRAM.

The Command displays:

- the memory block sizes
- whether they are used, and
- the total size of available free memory.

The command also queries the global memory RAM if in a multi-processor system.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D25: qr / (v | n) CCU / CCUME: qr / (v | n | gv | gn)
Variables	/v = volatile (static) RAM /n = non-volatile RAM (NVRAM) /gv = global volatile (static) RAM /gn = global non-volatile RAM (NVRAM)
Parameters	None
Example	Type *qr /gn* and press ENTER. Results: This displays the allocation and available free global NVRAM. The system displays the address and size of each block in hexadecimal, the total free memory, and number of free blocks in decimal notation before it returns to the prompt.
Special Considerations	Non-volatile memory cannot be queried if the NVRAM is corrupt

QX - Query Exchange

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to display information on system exchanges.

- If you request information on more than one exchange, then the output is in a list format. Each line contains an exchange name and ID, and the number of processes and messages queued.
- If you request information on all exchanges, the monitor derives and displays the number of free exchange control blocks.
- If you request information on a single exchange, then the monitor will display a more detailed description. The description includes the:
  - exchange name
  - queuing mechanism (FIFO or priority)
  - access rights (group only or unlimited), and
  - queue length (unlimited or decimal notation limit), followed by a list of:
    - all queued processes, and
    - all queued messages.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D25:		qx [(xid | name)]
	CCU / CCUME:		qx [(xid | gxid | name)]
Variables	None		
Parameters	(none)	=	displays general information for *all exchanges*.
	xid	=	pSOS exchange ID (in hexadecimal); displays detailed information for a specific exchange.
	gxid	=	global pSOS exchange ID (in hexadecimal); displays detailed information for a specific exchange.
	name	=	case-sensitive exchange name. It now supports the new exchange naming convention. If you enter an entire name, the monitor displays detailed information for that exchange. If you enter the first few characters, the command attempts pattern matching. The monitor displays general or detailed information, depending on the number of matches.

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QX - Query Exchange, Continued

Syntax (continued)

Example	Type *qx* and press ENTER. Results: The system displays the name, exchange ID, and number of queued processes and messages for every exchange in the system.
Special Considerations	None

RB - Resume Breakpoint

Platform

☑ CPM ☑ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to restart a process that stopped at a breakpoint, without removing the breakpoint.

It verifies the specified breakpoint, restarts the associated process, and then reinserts the breakpoint trap.

Syntax

Below is usage and syntax information for this command

Command Format	rb break_pt# [#reps]
Variables	None
Parameters	break_pt# = breakpoint number as returned with the define breakpoint command. #reps = number of times (in decimal) to repeat execution of the breakpoint address before stopping; default is zero.
Example	Type *rb 1* and press ENTER. This resumes breakpoint number one (1) that stops again before the second execution of the instruction at the breakpoint address. Results: The system responds with the prompt. Whenever it encounters a breakpoint, the system displays the breakpoint number, loop count, and register values. If the loop count is greater than zero, it is decremented. Otherwise, the process is suspended.
Special Considerations	None

RP - Resume Process

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to restart all processes, some processes, or a specific suspended process.

Use this command to restart processes that have been suspended using the suspend process (SP) command.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D25: rp [(pid | name)] CCU / CCUME: rp [(pid | gpid | name)]
Variables	None
Parameters	(none) = resume all processes. pid = pSOS process ID (in hexadecimal); resume a specific process. gpid = global pSOS process ID (in hexadecimal); resume a specific process name = case-sensitive process name. The monitor supports the new process naming convention. If you enter an entire name, the monitor resumes the specified process. If you enter the first few characters, the command attempts pattern matching. The monitor will then resume all matching processes.
Example	Type *rp* and press ENTER. This enables all suspended processes to resume execution. Results: Unless it encounters an error, the system displays the prompt. If it encounters an error, the system displays an error message before it returns to the prompt.
Special Considerations	*Do not* use this command to start a D25 after an NVRAM download or after an error caused it to halt. In these cases, you must reboot the D25 to ensure that all parameters and variables are re-initialized properly.

RR - Report RAM Partitions

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to display information on the RAM divisions currently configured in the system.

- On a D25 platform, this command reports the base addresses of the RAM and NVRAM regions, and the size of the NVRAM region.
- On a D200 platform, this command reports the base addresses of the global RAM and global NVRAM regions, and the size of the global NVRAM region.

In either case, the monitor reports total amount of free RAM.

Syntax

Below is usage and syntax information for this command

Command Format	rr
Variables	None
Parameters	None
Example	Type *rr* and press ENTER. Results: The monitor displays the information about existing RAM configuration.
Special Considerations	None

RT - RAM Test

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to perform a non-destructive read-write test of specified RAM memory.

The test may be for the entire RAM or NVRAM regions, or for a specified range of values. You may also select to run the test for a set number of loops, or to loop infinitely.

Note: If the input range is not on long word boundary, set the range ending address to the first lesser word boundary.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20: rt / (v | n) CCU / CCUME: rt / (v | n | gv | gn) [beg_addr end_addr [(#loops | i)]] D25: rt / (v | n | s) [beg_addr end_addr [(#loops | i)]]
Variables	/v = volatile (static) RAM /n = non-volatile RAM (NVRAM) /s = destructive sequential test /gv = global volatile (static) RAM /gn = global non-volatile RAM (NVRAM)

Parameters	beg_addr = first address of memory range (in hexadecimal)
	end_addr = end address of memory range (in hexadecimal)
	#loops = number of times to execute the finite loop for the specified memory (in decimal) before stopping
	i = use infinite loop

Example	Type *rt /gn 510000 5100b0 25000* and press ENTER. Results: This tests the integrity of the global non-volatile (static) RAM between the memory range of 510000 and 5100b0 repeatedly for 25,000 times. The system simply returns the prompt when it successfully completes this instruction. If the test fails, the system displays an error message before returning to the prompt.

Continued on next page

RT - RAM Test, Continued

Syntax (continued)

Special Considerations	If you enable the Debug Mode, the function can be CPU intensive, and could cause a system reset under these circumstances. You cannot use this function when the NVRAM is corrupt. Do not use the /s switch on a D25.

RTB - Return To BootROM

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☑ D25

Description

Use this command to place the device in System Service Mode. When you issue the command, the system stops executing out of the FLASH region, and it activates the BootROM operating system.

The primary use of this mode is for the downloading of FLASH application software to the RTU.

Syntax

Below is usage and syntax information for this command

Command Format	rtb
Variables	None
Parameters	None
Example	At the monitor prompt, type *rtb* and press ENTER. Results: The system returns to BootROM operation mode.
Special Considerations	The system halts and deletes all applications currently executing on the RTU when it activates the BootROM operating system.

RTC - Test CCU RTC

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☐ D25

Description

Use this command to test the RTC synchronization between nodes in a D200.

Syntax

Below is usage and syntax information for this command

Command Format	rtc [/r]
Variables	/r = reset back to initial settings
Parameters	None
Example	At the monitor prompt, type *rtc /r* and press ENTER.
Special Considerations	None

RX - Request Exchange

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to retrieve a message from one or more exchanges.

It returns the first message in each target message queue.

Syntax

Below is usage and syntax information for this command

Command Format	rx (xid | name)
Variables	None
Parameters	xid = pSOS exchange ID (in hexadecimal); make an attempt to retrieve a message from a single exchange. name = case-sensitive exchange name. The monitor supports the new exchange naming convention. If you enter an entire name, the monitor retrieves the message from that exchange. If you enter the first few characters, the command attempts pattern matching. The monitor retrieves messages from one or more exchanges, depending on the number of matches.
Example	Type *rx 304540* and press ENTER. This requests a message from the exchange with an ID of 304540. Results: The message is displayed as six long, hexadecimal words as: A999 : 00000001 00000002 00000003 00000004 The system displays the specified message, then returns to the prompt unless it encounters an error. If this is the case, it displays an error message before it returns to the prompt.
Special Considerations	You must only use this command in a testing or debugging context. If you take a message from an exchange indiscriminately, you cannot predict the results.

RZ - ZMODEM Download

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☐ D25

Description

Use this command to download configuration and application data over the serial port into RAM or FLASH. The **68K Monitor** accepts a transfer of ZMODEM binary data to the D25 initiated either by the D25 user or by the sending terminal.

When the transfer is complete, the DOWNLOAD command returns control to **68K Monitor's** command line.

Application code download only works when:

- executing from the BootROM, and
- the monitor has erased the FLASH region.

While the command downloads the file, it recognizes the ZLIB format of the compressed data and uncompresses it.

Syntax

Below is usage and syntax information for this command

Command Format	rz [/(Vlevel | Mtimeout | Ctimeout | Wwindow)]	
Variables	/Vlevel	verbose level, which determines the level of debug messages displayed (default is zero, any non-zero value will activate debug messages).
	/Mtimeout	set receive message timeout to the user specified value (the default is 2000 ms).
	/Ctimeout	set inter-character timeout to user specified value (default is 500 ms).
	/Wwindow	set receiver window size to user specified value (default is 1400 bytes).
Special Considerations	Before the start of the download, the system must suspend all non-protected process running in the system. • If there are parameters on the command line, the monitor assumes that the D25 initiated the download, and allows 20 seconds for the user to activate the software that will send data to the D25. • If there are no parameters, the monitor assumes that the sending software initiated the download and it will not provide a wait period. The command "rz" is the standard prefix used by the ZMODEM binary protocol to start a file transfer. A terminal using this command can connect to the D25 Monitor and simply start sending ZMODEM data without any further user input to the D25.	

Continued on next page

RZ - ZMODEM Download, Continued

WARNING

Executing this command modifies the memory of the D25, and can cause operational disruption.

Use caution before proceeding. Be sure that you really want to use this command and that you use it correctly.

Note ☞

When using ZMODEM, all files sent to the **68K Monitor** must have file names.

The file name for a FLASH image must start with "PROM". The file name for a ZLIB compressed image must end with the extension ".ZLB".

The name in these cases is case insensitive (i.e. "prom" and ".zlb" are acceptable as well). The monitor assumes that any other names are non-compressed NVRAM configuration data.

Since there is no addressing inherent in ZMODEM data, you must change the location of NVRAM in any existing configuration before downloading if you want to change the NVRAM header address.

SA - Serial Analyzer

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to monitor communications on one of the defined serial ports (other than the assigned **68K Monitor** port).

It uses serial I/O system transmit and receive call-outs to intercept all communications on the channel.

Syntax

Below is usage and syntax information for this command

Command Format	sa port
Variables	None
Parameters	port = serial port to monitor (COM#)
Example	Type *sa com7* and press ENTER. Results: This activates the serial analyzer monitor on communications port seven (SIO7). The monitor displays all communications on the specified channel until it receives CNTRL-C on the monitor channel. The display then returns to the prompt.
Special Considerations	This function cannot be used on the port assigned **to 68K Monitor** (COM0), the SPI port (_SPI), or the SCC1 port (SCC1). This function is completely non-intrusive. It cannot affect the operation of the application that owns the monitored port.

Error Codes

If any of the following receiver errors are detected, these codes are displayed:

- over-run errors OV
- parity errors PA
- framing errors FR
- detected breaks BR.

Display Format

The monitor displays all data transmitted and received in hexadecimal format.

Transmit data is displayed in inverse video; receive data is normal video mode.

Continued on next page

SA - Serial Analyzer, Continued

Buffered Data

The serial analyzer does not display data immediately. It buffers the data so that the serial analyzer remains non-intrusive. The buffer is large enough (1000 bytes) that overflow is unlikely. If the buffer does overflow, however, the indication provided is:

buffer overflow

The monitor discards incoming data as long as the buffer is in the overflow state. It does not destroy the current buffer contents.

SB - Step Breakpoint

Platform

☑ CPM ☑ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to single step a process that was suspended at a breakpoint.

It also allows executing multiple program steps in a single command.

Syntax

Below is usage and syntax information for this command

Command Format	sb break_pt# [#instructions]
Variables	None
Parameters	break_pt# = breakpoint number as returned with the define breakpoint command. #instructions = number of additional instructions to execute prior to stopping; default is zero.
Example	Type *sb 2 1* and press ENTER. This allows the process defined by the breakpoint number of 2 to perform two program instructions. Results: The system responds with the prompt. Additionally, each time it completes a program step, the system displays the breakpoint number, instruction count, and register values. If the instruction count is greater than zero, it is decremented. Otherwise, the process is suspended.
Special Considerations	None

SC - Select Active Configuration

Platform

☐ CPM	☐ D20 D20 Base	☐ D20 ME D20 Base	☑ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to select one of the stored configurations as the active configuration.

The system is halted and the stored configuration is uncompressed (if necessary) and written into NVRAM (local on the D25, global on a D200) as the new configuration.

The selected configuration file is marked as the active configuration.

Note: Upon completion, the Monitor leaves the system halted so that you can restart the system with the new configuration.

Syntax

Below is usage and syntax information for this command

Command Format	sc (file_num | file_name) [BaseAddress]
Variables	None
Parameters	file_num = The query configuration storage parameters command displays all existing files, giving each a numerical index. The monitor uses this index with the command to specify the file that it will copy into memory and make active. file_name = The name of the configuration file to select. The command will select the first matching configuration it finds. BaseAddress = base address at which to write the new configuration
Example	Type *sc config.bin* and press ENTER. Results: The monitor selects the stored configuration "config.bin" as the active configuration and copies it into NVRAM, overwriting the existing configuration.
Special Considerations	Once this function is invoked, it may take some time for the configuration to be decompressed (if necessary), and written into memory.

SET - Set System Parameters

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Note: This command is for developers only.

Use this command to quickly modify options in code during run time.

Syntax

Below is usage and syntax information for this command

Command Format	set [/h] <option> [(/d | <parameters>)]
Variables	/h = help /d = ?
Parameters	option = depends on application parameters = depends on application
Example	Not required
Special Considerations	Very dangerous to use, only for programmers.

SI - Display System Information

Platform

☐ CPM	☐ D20 D20 Base	☐ D20 ME D20 Base	☑ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to display information on the hardware, software and current configuration of the device.

Syntax

Below is usage and syntax information for this command

Command Format	si
Variables	None
Parameters	None

Example	Type *si* and press ENTER.
	
	D25A>si
	Physical RAM base address..... 0x0800000 Size: 6144K Bytes
	  NVRAM region base address..... 0x0820000 Size: 1024K Bytes
	  SRAM region base address..... 0x0920000 Size: 4992K Bytes
	FLASH base address..... 0x0200000 Size: 2048K Bytes
	CPU base address..... 0x0000000 Size: 8K Bytes
	DSP Dual-ported memory base address... 0x2000000 Size: 512K Bytes
	HC11 Dual-ported memory base address... 0x0006800 Size: 2K Bytes
	BOOTROM base address..... 0x0080000 Size: 512K Bytes
	Local I/O base address..... 0x3000000 Size: 1024K Bytes
	XCOM base address..... 0x1000000 Size: 1024K Bytes
	DSP Program memory base address..... 0x2000000 Size: 512K Bytes
	DSP Fault memory base address..... N/A
	Current Config Base..... 0x0820000 (128K)
	FLASH Config Base..... 0x081B000 (108K)
	DSP Type..... 2 Current Bank:2
	DSP CPLD Code Version..... 1.0
	XCOM Type..... 1
	  Ethernet Address (Primary)..... 00:00:C3:FE:06:68
	  Ethernet Address (Secondary)..... 00:00:C3:FE:06:69
	SYSFAIL signal state..... ON
	Aux Output state..... OFF
	EPLD Revision number..... 1
	--- More ---_
	
	Results: The monitor displays information on the configuration of the system.

Special Considerations	In earlier versions of the Monitor, this command was *dhw*.

SP - Suspend Process

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to stop all unprotected processes, some unprotected processes, or a specific unprotected process.

Use this command to stop all processes before CPU-intensive operations, for example, an NVRAM download.

Protected processes must remain running at all times. Protected processes include:

- MON monitor input process
- MOUT monitor output process
- WDOG watchdog process
- ROOT root process
- IDLE pSOS idle process
- LGIN boot login process (in some cases)
- iSCS processes, including B100 and file managers.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D25:		sp [(pid | name)]
	CCU / CCUME:		sp [(pid | gpid | name)]
Variables	None		
Parameters	(none)	=	suspend all unprotected processes.
	pid	=	pSOS process ID (in hexadecimal); suspend a specific process.
	gpid	=	global pSOS process ID (in hexadecimal); suspend a specific process.
	name	=	case-sensitive process name. The monitor supports the new process naming convention. If you enter an entire name, a specific process is suspended. If you enter the first few characters, the command attempts pattern matching. All matching processes are suspended.

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SP - Suspend Process, Continued

Syntax (continued)

Example	Type *sp* and press ENTER. Results: This suspends all unprotected processes. Unless it encounters an error, the system displays the prompt. If it encounters an error, it displays an error message before it returns to the prompt.
Special Considerations	This function stops the execution of tasks within the remote; you must not use it when the remote is active. Note: The safe way to restore normal operation after using this command is to reboot.

ST - Serial Test

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to start one of these two serial port test procedures:

- an automatic loop-back test of the defined serial port
  - transmits and receives a series of characters of different formats.
- manually forcing the mark or space line states from the RS-232 drivers
  - allows you to monitor and adjust modem levels or frequencies.

Syntax

Below is usage and syntax information for this command

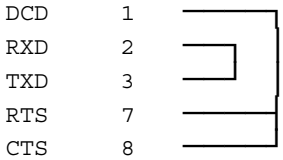
Command Format	CPM / D20: st /(f | l) port CCU / CCUME / D25: st /(f | l) port [baud]
Variables	/f = force mark or space states /l = automatic loop-back test
Parameters	port = serial port to test (COM#) baud = data rate in bps (decimal)
Example	Type *st /l com7 9600* and press ENTER. Results: This forces the RS-232 transmitter driver for communications port seven (7) to perform the loop-back test at 9600 bps. The system displays the current state of the test. Cancel the force test manually with CTRL-C. The loop-back test terminates either on an error or on completion of the test. The monitor displays the prompt after stopping either test.
Special Considerations	• These tests temporarily assume control of the specified communications port, and disrupt any current activity. • They may also, depending on the application, affect subsequent operation. To ensure that you avoid this, you must reboot the system when you complete all testing.

Continued on next page

ST - Serial Test, Continued

Loop Test Adapter

The automatic loop-back test requires this DB-9 pin loop-back connector:



Selectable Data Rates

The command used in CCU-based and D25 products allows you to select the data rate for the loopback test.

Supported data rates in bps are:

50	110
134	200
300	600
1050	1200
2400	4800
7200	9600
38400	

WARNING

The command has failed when used for stress testing. *Do not* use the serial test for that purpose!

You must only use it to verify the device driver for the communication port.

SX - Send Exchange

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to queue a message at one or more exchanges.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D25: sx (xid | name) m2 m3 m4 m5 CCU / CCUME: sx (xid | gxid | name) m2 m3 m4 m5 [/g]
Variables	/g = Allows the message to be sent to a queue in a different node
Parameters	xid = pSOS exchange ID (in hexadecimal); send message to a specific exchange. gxid = global pSOS exchange ID (in hexadecimal); send message to a specific exchange. name = case-sensitive exchange name. The command supports the new exchange naming convention. If you enter an entire name, the system sends the message to that exchange. If you enter the first few characters, the command attempts pattern matching. The system sends the message to one or more exchanges, depending on the number of matches. m2 - m5 = first through fourth long words in the body of the message, in hexadecimal.
Example	Type *sx 304540 1 2 3 4* and press ENTER. This sends a message identified as 304540. The command sets the first two reserved messages to 0. Results: The system displays the prompt unless it encounters an error. In this case, it displays an error message before displaying the prompt.
Special Considerations	You must only use this command in a testing or debugging context. If you send a message to an exchange indiscriminately, you cannot predict the results.

SYSC - System

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☑ D25

Description

Use this command to reset the reboot counter to zero.

Syntax

Below is usage and syntax information for this command

Command Format	sysc [(/?) | command]
Variables	/? = help
Parameters	command = rcount
Example	Type *sysc rcount* and press ENTER. Results: The reboot counter will be reset to 0.
Special Considerations	None.

TEST - Invoke Test Tool

Platform

☐ CPM	☐ D20 D20 Base	☐ D20 ME D20 Base	☐ D20/200 CCU Base	☑ D20/200 ME CCU Base	☑ D25

Description

Use this command to activate a test tool external to the monitor.

To use a test tool, the test tool application must:

- be included in the software for the system, and
- be created specifically to make use of this monitor function.

The **68K Monitor** relinquishes communications control to the test tool and waits for the tool to complete its processing before continuing.

Syntax

Below is usage and syntax information for this command

Command Format	test proc_name
Variables	None
Parameters	proc_name = The name of the test tool process, normally *Txxx*.
Example	None Required
Special Considerations	If the test tool application is suspended, the command will not function. The monitor must detect that the test tool is waiting for a signal before it will proceed.

TR - Trace

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☐ D25

Description

Use this command to track the execution sequence of the processes in the system.

Syntax

Below is usage and syntax information for this command

Command Format	tr [/h | /c | /s] tr /d [/c] [/e] [<start_time> [<end time>]] tr /r [/g] [<samples>] /t0 <pre_trigger> <address> <condition> <value> tr /r [/g] [<samples>] /t1 <pre_trigger> <trigger time> tr /r [/g] [<samples>] /t2 <pre_trigger> <process name>
Variables	/h = display help /c = clear all /s = stop collection /d = display gathered data /c – continuous display, /e – format for spread sheets /r = gather data /g = allocate buffers from global memory
Parameters	start_time = start time for trace to display. end time = end time for trace to display. pre_trigger = number of samples to store before the trigger address = the watch address to trigger on condition = Condition to watch for = != < > <= >= change value = value to watch for trigger time = RTC time to trigger process name = name of process to trigger on

Continued on next page

TR - Trace, Continued

Syntax (continued)

Example 1	Type *tr /r 20 /t0 10 208000 = 12345678* and press ENTER. Results: This will allocate a buffer for 20 samples and triggers when the long memory location becomes 12345678. It saves 10 samples before the trigger, the trigger sample and 9 samples more to fill the buffer.
Example 2	Type *tr /r 20 /t0 10 208000 change* and press ENTER. Results: This triggers if the long memory location changes value.
Example 3	Type *tr /r 20 /t0 10 208000 != 12345678* and press ENTER. Results: This triggers if long memory value changes from the value 12345678.
Example 4	Type *tr /r 20 /t1 10 00123456* and press ENTER. Results: This triggers when the RTC value if greater than or equal to 00123456.
Example 5	Type *tr /r 20 /t2 10 30123456* and press ENTER. Results: This triggers after the process with the ID of 30123456 runs.
Special Considerations	This function is only available as a special debug BootROM as there is not enough room for it to be permanently included. Currently, the BootROM code must have the TRACE command compiled into S043-0 before you can use this command. You will have to remove some other commands in order to make room for it.

UL - Upload

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☐ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to retrieve an S-record from the device's memory.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20: ul CCU / CCU ME / D25: ul beg_addr end_addr [width]
Variables	None
Parameters	beg_addr = start of address range end_addr = end of address range
Example	Type *ul* and press ENTER. Results: uploads the contents of NVRAM to the terminal, and returns to the prompt when completed.
Special Considerations	None

VER - Version

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to display the Base System and pSOS versions, plus any application version and embedded image information. On the D25, the monitor will also display the BootROM version.

The provided information consists of:

name - application or embedded image name

version - image version number

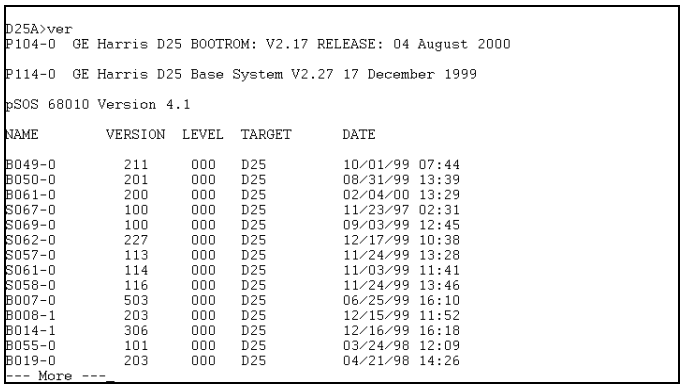
level - image compilation level

target - hardware target (i.e., D20M++, D25, D25_FF)

date - image compilation date and time

Syntax

Below is usage and syntax information for this command

Command Format	D20 / CCU / CCU ME: ver D25: ver [/d]
Variables	/d Display DSP flash versions
Parameters	None
Example	Type *ver* and press ENTER.  Results: The monitor displays at least the boot code and pSOS version information and returns to the prompt.
Special Considerations	None

```
D25A>ver
P104-0  GE Harris D25 BOOTROM: V2.17 RELEASE: 04 August 2000

P114-0  GE Harris D25 Base System V2.27 17 December 1999

pSOS 68010 Version 4.1

NAME        VERSION  LEVEL  TARGET      DATE

B049-0          211    000   D25         10/01/99 07:44
B050-0          201    000   D25         08/31/99 13:39
B061-0          200    000   D25         02/04/00 13:29
S067-0          100    000   D25         11/23/97 02:31
S069-0          100    000   D25         09/03/99 12:45
S062-0          227    000   D25         12/17/99 10:38
S057-0          113    000   D25         11/24/99 13:28
S061-0          114    000   D25         11/03/99 11:41
S058-0          116    000   D25         11/24/99 13:46
B007-0          503    000   D25         06/25/99 16:10
B008-1          203    000   D25         12/15/99 11:52
B014-1          306    000   D25         12/16/99 16:18
B055-0          101    000   D25         03/24/98 12:09
B019-0          203    000   D25         04/21/98 14:26
--- More ---_
```

VP - Signal Process

Platform

☑ CPM ☑ D20 D20 Base ☑ D20 ME D20 Base ☑ D20/200 CCU Base ☑ D20/200 ME CCU Base ☑ D25

Description

Use this command to send a pSOS signal to one or several processes. Use it during development of application software.

Syntax

Below is usage and syntax information for this command

Command Format	CPM / D20 / D25: vp (pid | name) event CCU / CCUME: vp (pid | gpid | name) event
Variables	None
Parameters	pid = pSOS process ID (in hexadecimal); send the signal to a specific process. gpid = global pSOS process ID (in hexadecimal); send the signal to a specific process. name = case-sensitive process name. The command supports the new naming convention. If you enter an entire name, the command sends the signal to a specific process. If you enter the first few characters, the command attempts pattern matching. It then sends the signal to all matching processes. event = hexadecimal format word of the bits with which to signal the process(es).
Example	Type *vp 308048 1000* and press ENTER. This signals the process with pSOS ID 308048 with the 13th bit (i.e., bit 12) zero-based. Results: Unless it encounters an error, the system displays the prompt. If it encounters an error, it displays an error message before it returns to the prompt.
Special Considerations	You must only use this command as a testing or debugging mechanism. If you send an indiscriminate signal to a process, you cannot predict the results. Note: The safe way to restore a system to normal operation after using this command is to reboot.

WINM - WIN Metrics

Platform

☐ CPM ☐ D20 D20 Base ☐ D20 ME D20 Base ☐ D20/200 CCU Base ☐ D20/200 ME CCU Base ☐ D25

Description

Use this command to report statistics on processing in the Base System software.

Syntax

Below is usage and syntax information for this command

Command Format	winm ((/r [data_type]) | data_type)
Variables	/r = reset
Parameters	data_type = <refer to code>
Example	Not required.
Special Considerations	Requires special code to use this command.

Index

B

Boot Command
BOOT 3-7

C

Calibrate KI Command
CAL 3-9
Change Auto-logout Timer Command
AL 3-4
Change Configuration File Attributes Command
CCA 3-11
Change Priority Command
CP 3-17
Check Sum Command
CS 3-18
Clear Breakpoint Command
CB 3-10
Clear Configuration File Command
CCF 3-14
Clear Screen Command
CLS 3-16
Control Cache Command
CACHE 3-8
Copy File Command
CF 3-15
Create Configuration Storage Block Command
CCB 3-12

D

Debug Mode Command
DEBUG 3-22
DM 3-28
Decompression Status Command
DSTAT 3-29
Define Breakpoint Command
DB 3-21
Directory Command
DIR 3-25
Display File Data Command
DF 3-23
Display Hardware Command
DHW 3-24
Display Image Information Command
IMG 3-41
Display System Information Command
SI 3-71
Download Command
DL 3-27
Dump Memory Command
D 3-19

E

Echo Toggle Command
ECHO 3-32
Edit Memory Command
E 3-30
Error Log Command
EL 3-33
Ethernet Address Command
ETH 3-35
Exit Command
EXIT 3-36

F

Fill Memory Command
F 3-37
Find Table Command
FT 3-38
Flash Erase Command
ERASE 3-34

H

HDLC Test
HT 3-40
Help Command
HELP 3-39

I

Invoke Test Tool Command
TEST 3-78

J

Jam Exchange Command
JX 3-43
Jump To Flash Command
JTF 3-42

K

KI Metrics Command
KIM 3-44

M

Move Memory Command
M 3-45

P

Print Breakpoint Command
PB 3-46
Profile Command
PR 3-47
Program Flash Command
PRG 3-49

Q

Query Configuration Storage Parameters Command
QC 3-50
Query Exchange Command
QX 3-54
Query Process Command
QP 3-51
Query RAM Command
QR 3-53

R

RAM Test Command
RT 3-59
Report RAM Partitions Command
RR 3-58
Request Exchange Command
RX 3-63
Resume Breakpoint Command
RB 3-56
Resume Process Command
RP 3-57
Return To BootROM Command
RTB 3-61

S

Select Active Configuration Command
SC 3-69
Send Exchange Command
SX 3-76
Serial Analyzer Command
SA 3-66
Serial Test Command
ST 3-74
Set System Parameters Command
SET 3-70
Signal Process Command
VP 3-83
Step Breakpoint Command
SB 3-68
Suspend Process Command
SP 3-72
System Command
SYSC 3-77

T

Test CCU RTC Command
RTC 3-62
Trace Command
TR 3-79

U

Upload Command
UL 3-81

V

Version Command
VER 3-82

W

WIN Metrics Command
WINM 3-84

Z

ZMODEM Download Command
RZ 3-64